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B. BURGESS, CAPTAIN,  
*Secretary.*

WHITEHALL YARD,  
*July, 1884.*







# The Journal

OF THE

## Royal United Service Institution.

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Friday, March 21, 1884.

GENERAL SIR J. LINTORN A. SIMMONS, G.C.B., R.E., in the Chair.

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### IMPERIAL DEFENCE: PART I. HOME DEFENCES.

By Colonel SIR CHARLES H. NUGENT, K.C.B., R.E.

SIR CHARLES NUGENT: Before I commence, I should say, in justice to those who have worked on this subject, that I have availed myself largely of the labours of those who have gone before me, especially of General Collinson and of Captain Colomb; but in justice to myself I may say I am no plagiarist, inasmuch as I commenced to consider this subject some eight or nine years ago, under the directions of our Chairman, with whom it is pleasant to me to be associated again, after a brief interval, on this occasion.

Four years ago, a noble lord who had been Under-Secretary of State for War, and who is now Viceroy of the Dominion of Canada, presiding in this Institution at a discussion which followed a paper upon "The Adaptation of Ocean Steamers to War Purposes," made use of these words, "I am not going to enter into party politics, particularly at a moment when the political atmosphere is so bracing and invigorating as it is now, but I am bound to say,—*it is not so much party feeling from which these (defensive) questions suffer, as the apathy and indifference of a large section of the English public.*"

The state of the political atmosphere is to the full as bracing and invigorating now as when these words were uttered, but by the salutary practice of this Institution party politics are excluded from these meetings, and I am actuated by no party motive to take advantage of the present occasion, which seems opportune for an attempt to stir up the English Public to throw off the apathy and indifference with which they habitually regard all matters connected with "The Defence of the Empire."

When I reflect upon the gravity of the issues involved, I am lost in amazement at the indifference of the Public. To what is this indifference to be attributed? It cannot be to want of information, for this subject has been placed before them over and over again, here and elsewhere, under every aspect; it cannot be to any inherent difficulty in the subject, for it is devoid of professional technicality, and so

simple that a child may comprehend it; it cannot be that it is without interest, for it is of vital interest to all, and more to the Civil than to the Military portion of us.

Is it that we are so wrapped up in our individual concerns that we have no longer attention to spare for the more important concerns which affect the body corporate, which we call the State, and so, putting out of sight, as no business of ours, what is everybody's business, are content to live on in a fool's paradise, from which we may any day be rudely awakened?

Be the cause of this indifference what it may, the present time is not only opportune, but demands careful consideration of the state of our defences.

Look where we will throughout Europe, there is cause for grave anxiety;—a vague feeling of uneasiness and mistrust prevails everywhere. Nation watching nation, all stand armed to the teeth in painful expectancy: the Eastern Powers allied;—against whom? the Western Power which should be husbanding her resources with a view to European contingencies, frittering them away in distant parts of the world, in expeditions of doubtful profit.

What is our position? In Europe,—committed to the moribund Empire of Turkey, we stand in unwilling antagonism to the adjoining nations: in India,—menaced by the Russian occupation of Merv;<sup>1</sup> in Egypt,—entangled by force of circumstances which we have not foreseen, and from which we are unable to extricate ourselves; at the Cape,—pledged to a policy beset with difficulties.

On every side the elements of strife abound.

An Officer of the highest military position is credited with having stated publicly, not long ago, that he regarded a great European War as a certainty, and at no distant future; and within the last few weeks a late First Lord of the Admiralty impressed upon a public meeting that Europe, at the present moment, stood like a vast armed camp from the Ural Mountains to the Bay of Biscay.<sup>2</sup>

These are some of many instances which might be quoted, for many swell the note of alarm, but few greet us with the reassuring sound of preparation: so seldom is this latter heard that it was with

<sup>1</sup> Since occupied, as also Sarakhs, a position of much greater importance.—Ed.

<sup>2</sup> A Berlin paper, discussing the affairs of Egypt, says, "its final incorporation with the British Empire will nearly complete the links of the gigantic chain which insular supremacy has been diligently endeavouring to coil round the body of old Europe. Napoleon's attempt to break the insular supremacy of England failed, because he confounded Europe with France. If Germany is now to achieve what Napoleon failed to accomplish, she must rally round her the nations of the Continent against the intolerable predominance of England; but the jealousy and revengefulness of France hinders the inauguration of a German Continental policy favourable to the common interests of Continental States."

"Austria has already yielded to the charms of this idea, Russia is returning to her old love, Italy and Spain have a tendency to gravitate towards the Teutonic and anti-English centre."

"France will at last perceive that her interests are identical with those of Germany, who, thus placed at the head of an united Continent, will be able to shake off the chain which insular supremacy has for nearly two centuries been binding round old Europe."—"Globe," March 3, 1884.

no common satisfaction we received at our last annual meeting the assurance of the First Naval Lord that at the Admiralty they had been occupied for the last two years with the consideration of the *matériel* and *personnel* of the Navy, its disposal in the event of war, and how it was to be rendered most efficient, and he especially instanced the adaptation of the great merchant steamers to serve as armed cruisers.

Two years—a great deal may be done,—but a great deal also may be left undone,—in Two years.

It is now nearly twice Two years since a Committee commenced to enquire into the defences of our Commercial Harbours at home, and what has been the fruit of their labours? It is twice Two years since Captain Colomb, alluding to the Royal Commission on the Defence of Ports and Coaling Stations Abroad, wrote, "*For the first time in the history of our Empire we are about to enquire, how to defend it.*" And then, with cruel irony, he added, "*A Royal Commission is a great public instructor; it collects authentic facts, and by their subsequent publication, knowledge is increased and attention awakened.*"<sup>1</sup>

I hope the gallant Captain and the Public are satisfied with the instruction they have received, and with their increase in knowledge; but for my part I may say that I have seen no fruit of the labour of the Commission, and have never met any one who had read their Report.

In a Paper which I had the honour of reading in this Institution some four years ago, I discussed the general principles which should guide us in dealing with the defence of Capitals, and as a deduction therefrom I dwelt upon the necessity of Works of Defence for the protection of London.

And here it may be well to advert to the proposal recently put forward in a leading journal to build the Works for the defence of the metropolis in three weeks. Now, I venture to say that the writer who put forward this proposal was utterly ignorant of the subject upon which he was writing. If he had been engaged upon designs of Works for the defence of London, he would have known that the Works could not be built, in three weeks, nor in ten times three weeks, into a defensible condition. But supposing, for the sake of argument, they could be built in three weeks, how much farther time would be needed to place their garrisons and munitions in them, and to drill the garrisons to the Works which they would have to occupy, a very important matter in the defence of Works with well-trained soldiers, but how much more important with the description of troops which, if not wholly, in a great measure would be allotted to these Works?

Conceive the bustle, the delay, the confusion of collecting and setting to work upon these defences 30,000 or 40,000 navvies, the transporting to them hundreds of guns and gun-carriages, powder and shot, and the munitions of many thousand soldiers, and, finally, the movement of the soldiers themselves. Probably by the end of the first week all would be in a state of such helpless confusion that the Works would be abandoned, and the time and labour bestowed upon them lost. The troops would bivouac upon the spot, and do the

<sup>1</sup> *Vide* "The Defence of Great and Greater Britain."

best they could with the assistance of the navvies, or of such of them as were not in the way, to throw up field Intrenchments, to which they had much better have limited themselves at first, as by the attempt to achieve the impossible they will have already lost a week, and one week—not three weeks—will have decided the matter. Napoleon, in 1805, asked only for six days' command of the Channel, saying that he would be in London on the fifth day.

I urged also the impolicy of leaving our only Arsenal in its present exposed position at Woolwich, and the necessity of subdivision of stores. Whatever may be the convenience of collecting stores into one spot during peace, it is more than counter-balanced by the difficulty and the inconvenience of issue from one spot in the event of war; indeed in the case of an invasion of this country the delay which must take place in the issue of stores from Woolwich would be a source of very grave danger,—and so as far as stores and munitions of war are concerned the cry should be, *Decentralization and Subdivision*.

Whatever views may prevail as to the development to be given to the defensive measures I then advocated, and I can understand that experts may honestly differ widely as to the development, I cannot believe that, as a matter of principle, there can be difference among thinking men, who have been at the pains to give to the subject the careful consideration which it merits.

I assume, then, that the Capital is defended and that a Central Arsenal has been formed in any convenient position, and, starting from this, I propose to consider what measures are necessary for the defence of the United Kingdom.

In the previous Paper I insisted upon the unwisdom of expecting too much from our Fleet, pointing out that it has its own special and appropriate duties to perform, and that the defence, locally, of our Commercial Ports is not amongst those duties.

The introduction of steam as the motive agent has, by making them to a certain extent independent of weather, rendered the operation of ships more certain and more mechanical, and has thus placed other nations upon a somewhat more equal footing with us. I do not hold with those who assert that it has rendered of less importance the seamanship upon which we formerly relied and which availed us so much in the past; to me it seems that seamanship may be, and is, as truly shown in turning the waters to our service, by the agency of steam, as by the agency of sails.

The development of artillery and of armour has reduced the number while increasing the size of battle-ships, and so it has come to pass that the units available for the protection of widely distant points of importance, and for operations over lengthened and still lengthening Lines of Communication, have become fewer than ever.

Home Defensive measures then should have for their object the security of our coast-line, so that our seagoing ships may be relieved from sentry duty upon the coast, and may be left free—

1. To act in masses upon the enemy wherever that enemy is to be found.

2. To protect our Lines of Commercial Communication.



3. To undertake the defence, externally, of our Territories beyond the seas.

What is necessary to render our coast-line secure?

1. Defences for the Vulnerable Points of our coast.

2. Fortified harbours in which our war-vessels may collect, either with a view to offensive operations, or for shelter, and for the means of refitting after a reverse.

A great deal has been done, and will be done, in the Fortification of our Military Ports, Portsmouth and Plymouth, Portland, Pembroke, and Cork, Dover, Sheerness, and Chatham; but some of them require development to meet the altered conditions of the present day. Unfortunately, too, some of the Fortifications recommended by the Royal Defence Commission of 1859 were omitted, in deference to political exigency;—these omitted works should be undertaken at once, especially the Fortifications on the west side of Chatham, and between it and Gravesend; the works on the south-east side have, thanks to the energy of our Chairman while Inspector-General of Fortifications, since been commenced, and are already, by the agency of convict labour, far advanced.

The incomplete state of the Fortifications of Chatham,—jeopardizes our great Naval Establishment there,—paralyzes the Defences of the Thames by permitting access to their rear,—and must, if suffered to continue, act very prejudicially upon any measures for the defence of London.

Leaving then the Military Ports out of consideration, what are the Vulnerable Points of our coast?

United Kingdom.	Population, 35,262,762.	Commerce, £694,105,264.	Tonnage, 98,773,156.
		£	
London.....	4,766,661 '13	198,291,323 '285	15,142,223 '26
Liverpool .....	552,508 '015	195,863,002 '282	13,258,076 '22
The Humber.....	111,549 '003	53,935,573 '078	4,695,479 '08
The Clyde.....	586,431 '016	29,854,134 '043	6,033,116 '1
Southampton.....	60,051	16,845,806 '024	2,168,296 '036
The Forth .....		14,367,809 '02	2,364,237 '04
The Tyne Ports.....	275,287 '008	11,197,542 '016	7,573,010 '13
The Tees.....	121,476 '004	9,863,673 '014	2,561,808 '05
Bristol.....	206,874	9,128,550	1,695,877
Cardiff.....	82,761	6,102,493 '026	5,046,709 '15
Swansea.....	65,597	3,087,620	1,701,244
Dublin.....	273,064 '008	3,072,361 '004	2,840,326 '07
Belfast .....	207,671 '006	2,752,505 '003	3,000,740 '08
Sunderland.....	116,542	1,274,111 '0019	2,750,857 '06
Folkestone .....	.....	11,539,621	396,793
Newhaven.....	.....	9,355,164	354,426
Dover .....	.....	7,426,111	594,445

They are those places of which,—the wealth and commercial trans-

actions are so great as to invite attack,—and of which the fall, or bombardment involving destruction of ships and warehouses with the goods and property they contain, would be attended with serious loss to the nation; or which falling into the hands of an enemy would afford secure Bases for his future operations.

Excluding from consideration London, which is only inserted for purposes of comparison, the places referred to above are set down in their order of Commercial importance in the table<sup>1</sup> (p. 431).

Many of these Ports are of farther and national importance—as possessing large private shipbuilding yards, arsenals, and the resources necessary for repairing and refitting, at all events, our smaller vessels.

1,091 vessels of 608,878 tons were built last year in the United Kingdom, and of these 364 vessels of 339,643 tons, more than half the total tonnage, were built in five of these Ports alone.

Yet of the Ports enumerated in this table, Southampton alone is secure, and that from its position; in a less degree this may be said of Bristol and Cardiff. Liverpool and the Forth have some defences, excellent as far as they go, but they do not go far enough. The Tyne is partially defended; and leaving Dublin and Belfast out of consideration for the moment, the defences of the others are *nil*, or so small as to be practically *nil*.

There are a considerable number of Ports of secondary importance, which though they do not fall into the preceding category, should not be suffered to pass into the hands of an enemy. Some would be good Bases of Operation for him, others would form convenient places for the debarkation of stores, and so assist him materially in the execution of his projects of invasion.

The principal of these are Harwich, Yarmouth, Lowestoft, the Tay, Aberdeen, Wick, Thurso, Ramsgate, Folkestone, Rye, Newhaven, Littlehampton, Poole, and Dartmouth, Wexford, Waterford, Kinsale, Galway,—and there are others.

For these, slight and inexpensive works will suffice.

There are also great stretches, especially upon the southern and eastern coasts, upon which an enemy might land in almost all weathers and at all times of tide; for instance, about Ramsgate, between Folkestone and Beachy Head, where so many times in the past our enemies found their way to land; and beyond Beachy Head towards Selsea Bill; on the East Coast, between the Colne and Blackwater,—in the neighbourhood of Yarmouth and Lowestoft; and there are other parts of the coast, which the distances from the capital render less important,—but they should not be neglected.

I do not propose that Works of defence should be thrown up at all these places, but all should be carefully examined and positions from whence to oppose a landing, or on which to fight an action, clearly marked out beforehand, and all the dispositions for placing the coast

<sup>1</sup> If the value of the Trade passing Coastwise in and out of the port of London be added, the Commerce of London rises to the enormous total of 250,000,000*l*.

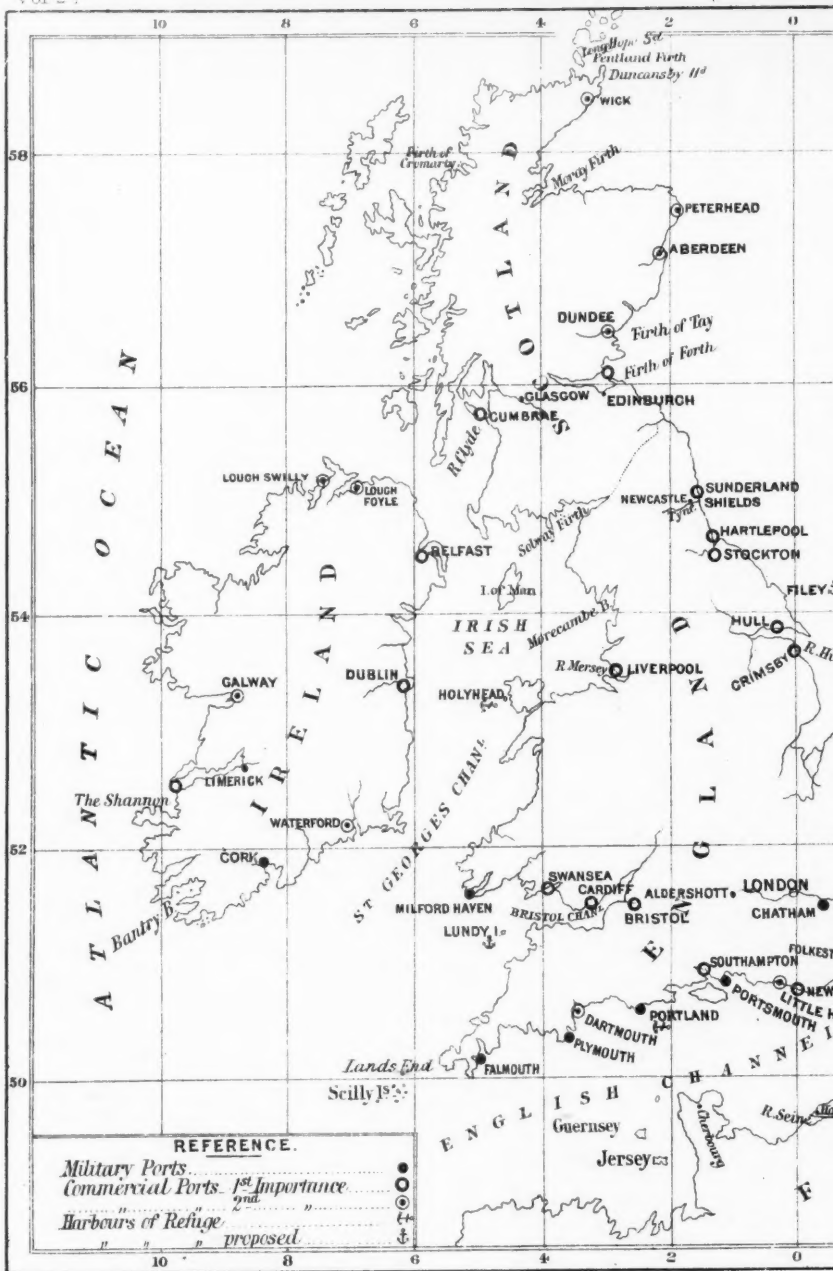
The Tonnage Coastwise of London is three-fifths its Tonnage to and from Places Abroad, given in the third column above. The Tonnage Coastwise of Liverpool is only two-fifths of its tonnage to and from Places Abroad.

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force in readiness to act at the precise spot at the precise moment prepared beforehand—and not only prepared beforehand, but rehearsed beforehand. This rehearsal is of grave importance, for time is everything, recollecting that the moment of landing is the moment of the enemy's greatest weakness.

But some say,—we,—in this country,—do not need so much preparation beforehand—for have we not the best railway system in the world? and, if so, can we not place any number of troops,—upon any part of the coast, at any time, at our pleasure? Admit that we have an unsurpassed railway system, though unfortunately it has been disposed not with any view to—and not in the best manner for—military purposes, yet never was there a greater mistake; in the first place, it is a moot point whether railways favour the invaders more than the defenders. Admit again, however, that, in our case, they favour the defenders, the places upon the South and South-East coasts are at such distances from the centre that little or no advantage is to be obtained from railways in the transport of troops; in short, their distances from London are below the minimum distance at which railways can be employed with advantage—that minimum distance is in England taken at 45 miles. In Prussia it is taken at 100 miles, but there the trains run at a slower speed.

Perhaps some here present are not aware of the severe strain the movement of armies imposes upon the management of railways. To move an army, 4 trains of 35 carriages are required per 1,000 men, and even with more convenient platforms and sidings than are to be found at most English railway stations, it is not safe to reckon upon more than one train an hour per day of twenty-four hours' travelling at 30 miles per hour. To take the most favourable view, the railways would be of little service in the emergency of war except for the movement of troops from distances beyond the metropolis.

Here I cannot but regret the loss of many of the Martello towers, which the wisdom of our predecessors placed along the stretches of accessible coast. The simple form which they adopted would not be suited for present times, but there the towers were; they might easily have been modified—those that remain will probably be modified—to carry a good gun of long range, useful against unarmoured vessels and boats, and some towers, where the situation offered facilities might have been protected by screens of earth.

If the first of the Ports in the Table above were destroyed, it would be a deadly blow to our shipbuilding interest. I do not pretend to estimate the injury to the nation, but this much I may say, that it would be in the highest degree calamitous.

This is no imaginary danger, as some may be inclined to think.

A sagacious writer points out that the power of rapid and sudden concentration upon any given point is so certain in these days of large and rapid steamships that it is absolutely necessary for our independence that we should be able to protect ourselves *independently of our Fleet*, and he says that it is discreditable to us as a nation that, with so large a population in proportion to the extent of our coast-line, there should be any difficulty in accomplishing it.

I ask you is it creditable to us as a wise and prudent nation to allow this state of insecurity to continue? We pride ourselves on the prudence with which we conduct ordinary business matters; we scrutinize carefully our position; we make ample preparation to meet our liabilities, and we add to our reserves as these liabilities extend;—contenting ourselves with smaller profits that we may be able to insure against the loss of the machinery, or of the vessels by which our business is worked and carried to its markets, and yet we cannot find it in our hearts to pay the paltry insurance that will suffice to keep our house in safety and our goods in peace.

I say advisedly the paltry insurance, for this, which I will call "*National Insurance*," is paltry compared with the sums paid annually for Assurance.

I find that during the year 1882 the sums assured and the premiums paid were as follows:—

	Total assured. £	Premiums. £	Losses by fire. £
Life Assurance..	435,000,000 ..	14,175,112	
Fire ..	2,834,000,000 ..		9,200,000
Marine ..	450,000,000 ..	13,000,000	

Yet National Insurance includes Life, Fire, Marine, and all other forms of Assurance, and renders them absolutely secure, and not only is this the case, but without National Insurance they are anything but secure; I had almost said they are absolutely insecure.

If our Fleet were scattered to the winds, and the enemy's cruizers triumphant on every ocean, what would be the value of the 450,000,000*l.* of Marine Assurance? If the enemy had landed, nay, were even landing on the South Coast, and our Militia and Volunteers were on the march to meet him, how much of the 435,000,000*l.* Life Assurance might their next-of-kin hope for? or if, having dispersed the Militia and Volunteers, he had gained the Surrey Hills, and had sent therefrom his herald to knock at our doors here? I for one would not take the London portion of the 2,834,000,000*l.* of Fire Assurance as a gift.

These are by no means impossibilities; more unlikely things have happened, and what has happened may happen again; and if it should happen,—what then? You may pass the sponge over those figures! Those figures, a mere bagatelle then, are neither the only nor the most important things that will be expunged.

If then we neglect to effect National Insurance now, while there is time, we fail in our duty to our country, and are guilty of the worst form of selfishness to those who come after us.

No doubt in a country like ours, those who are responsible for its safety have much difficulty in dealing with a question such as this.

They are sure to have against them—

1. The Fearless,—a large section of the community who fear nothing,—because they know nothing; for this section I can propose nothing but education.

2. The Peace at any price party,—that is, at any price except that of precautionary expenditure, who decry all military expenditure, and

have persuaded themselves that, whatever other nations do, we can stand aloof and look on.

Why should we stand aloof? Has it never occurred to any other nation that it might with advantage invade this country? In a book published not very long ago in a neighbouring country, the possible modes of invading England are discussed in minute detail and with considerable gusto; indeed, there is scarcely a nation of the Continent which has not put forth some scheme for the invasion of England, and the object of all these schemes is London, if they can only get possession of London, there is an end of England,—they can do what they like, dictate what terms they like—while, as far as I am aware, and this is a significant fact, no Englishman has elaborated any scheme for the invasion of a Continental nation, though time after time we have had under consideration the best means of resisting invasion.

The fact is that we are by nature unaggressive; we are intent upon commercial pursuits, and we may probably think, if we give ourselves the trouble to think at all about it, that we give no occasion for offence, and so we trust overmuch to our insular position, this insular position so happily described by old John of Gaunt, before the days of Channel Tunnels:—

“ This fortress built by Nature for herself  
Against infection and the hand of war,  
This happy breed of men, this little world,  
This precious stone set in the silver sea,  
Which serves it in the office of a wall,  
Or as a moat defensive to a house,  
Against the envy of less happier lands.”

The Channel Tunnel has for the present collapsed, and it is unnecessary to dwell upon it here, but this I may say, that it would be distinctly an additional element of danger, and would facilitate the passage of the “moat defensive,” and therefore should not be undertaken. The consensus of naval and military opinion, and certainly the best of naval and military opinion, is opposed to it, and no mere majority of a Parliamentary Committee should be permitted to give it being. Regarded defensively, there can be no doubt that the encompassing sea should be maintained inviolate. It is remarkable but suspicious how keen our neighbours are respecting its construction; they cannot hope from it for much increase in commercial relations with us, though we might with them; and, considering the number of harbours on the opposite coast, which they are developing and fortifying, and which harbours seem scarcely to need such development for commercial purposes, this extreme anxiety for Tunnel communication may well be regarded with suspicion.

The French are spending 5,574,000*l.* on eight harbours in a space of 250 miles of the opposite coast.

Perhaps the Peace at any price party base their dreams upon extension of national intercommunication, hoping that the interchange of ideas will exert a civilizing influence, and lead to an universal brotherhood, when wars shall be unknown and quarrels shall be settled by arbitration; this blessed time may come, but our children's children

will scarcely see it. Personally I do not place confidence in arbitration, in legal matters it is, in my experience, a costly form of settlement. And it should be remembered that Arbitration is of no avail unless backed by a power capable of enforcing the award of the Arbitrators;—those who believe in Arbitration have not stated how the execution of its awards is to be enforced.

It is painful to think how little progress the world has yet made in the direction of peace. About three years ago this party were jubilant over the talk of a general disarmament, and I know not what schemes were mooted for making Prince Bismarck the prime mover in it; yet in the interval the German Army has increased by 175,000 men; the French Navy has increased by 130 vessels, of which nine are iron-clads; and the Russian Army has increased by 628,000 men.

3. The Economists, who regard with abhorrence all expenditure.

If expenditure upon Insurance be true economy, I may perhaps plead that already I have by anticipation met this party, but they may, and probably will, say that the nation is already taxed to its limit of endurance. As a taxpayer I may perhaps be permitted to doubt this; nevertheless, as a taxpayer I think it undesirable to impose additional taxation; it is not my province to say how taxation should be imposed, but this much I may say, that there are forms of national expenditure which might give place to the expenditure I am advocating.

However, I do not advocate this Service of defence at the expense of any other Service; if it should be done, it should be done—no matter at what cost. Great Britain is wealthy enough to meet this and every call upon her; indeed, her wealth is her strength and her danger—and to preserve her from the danger her wealth must be liberally but judiciously employed.

It may be argued that money spent on Fortifications is unprofitably spent, that there is no finality in Defence, and that we have scarcely completed the expenditure upon one scheme of defence before we are called upon to make provision for another. No doubt in a certain sense this is true, but true of all kinds of protection, naval as well as military, but the military protection I am advocating is of all protections the cheapest and the most permanent, it costs less at starting, it lasts longer, it costs less to maintain, and it requires fewer men for its service,—it renders our small standing army of tenfold effect,—and it gives mobility to our Fleet.

It may be worth while to pause for a moment here to consider what our Fleet has to do.

It has to meet the Fleets of any nations which may be opposed to us.

It has to watch 92,000 miles of Communications, and to guard the enormous traffic, which in 19,311 vessels is passing continually to and fro along these Lines of Communications.

It has to carry stores and reinforcements to our Garrisons abroad.

It has to protect a coast-line in Great Britain and Ireland 3,000 miles in extent, in which there are between fifty and sixty Vulnerable Points, of which twenty<sup>1</sup> are of the first importance.

<sup>1</sup> This includes eight military points, viz., Portsmouth, Plymouth, Portland, Milford, Cork, Harwich, Dover, the Thames.

If the Fleet were twice, nay three times as numerous as it is, it would scarcely be too much for all these duties.

By recent Returns it appears that the British Fleet consists of forty-four ironclads, and seventy-nine unarmoured cruisers.

These are apportioned to eight Foreign stations and the Channel station, and if these are provided for what is left for coast defence?

4 battle-ships, 3 coast reserve ships, 7 coast defence and 9 auxiliary armoured ships, and 31 cruisers.

Do what we will, we shall never, I fear, have all the battle ships we should have, so much the more reason that the limited number we have should not be frittered away by sub-division,—that it should be held for operating in masses,—that the most important of our Vulnerable Points should be placed in absolute security, and that the less important should be so protected that they may occupy an enemy for a time, at least sufficient to afford to our Fleet the opportunity of arriving to their relief.

This is neither so difficult nor so costly a problem as at first sight it appears, and the solution will be found in a judicious combination of land and water defences, in which submarine mines will occupy an important position.

Submarine mining has recently received considerable development, and combined with shore batteries, submarine mines are a defence especially suited for our purpose; they are not very costly, they may be put down at the time of need, and, if protected by batteries on the shore and guard boats on the water, they will compel an enemy to make his approach cautiously, and to spend more time over the attack of a small place than its capture is worth.

They have the farther advantage that they do not require for their service a great number of men, some only of whom need to be specially trained, while a considerable portion of the boats and boating material necessary for their application can be found upon the spot.

In general terms the defences I have in contemplation would for Harbours of Primary importance be composed of shore batteries and submarine mines, supplemented by gun- and torpedo-boats, and, in cases where the interests at stake are large, or where the waters are wide and deep, and the channels open, by Coast Defence vessels.

For Harbours of Secondary importance, smaller batteries of lighter armament, and submarine mines supplemented by torpedo-boats, will probably in most cases suffice, for in most cases the waters to be defended will be so confined and so shallow as to be secure from hostile vessels of the larger classes.

I need scarcely say that it is of no use to provide the defences we have been considering unless we provide also men for manning them.

Leaving the Military Harbours out of consideration, it is probable that 22,000 men will be sufficient for all purposes, composed as follows: '30 Artillery, '12 Engineers, '35 Infantry, and '23 Seafaring men.

Perhaps the first two items may be provided by the volunteer organization, or some expansion of it in the direction of Artillery and Engineers; but I understand that there may be more difficulty

respecting the naval item, because in the event of war the expansion of the navy will be so great that it will absorb all the 15,000 naval reserve men, or as many of them as it can lay hands on, all the 4,000 coastguard men, and the 2,000 naval pensioners, for manning the ships now laid up in ordinary, but then put in commission, and for the service of auxiliary cruisers.

I can only re-echo the recommendation of General Collinson that a Sea Militia should be raised from the seafaring population to supplement the Land Militia; he showed what was the organization in 1805 for the "Sea Fencibles," which may be summarized thus: The division of the country into districts, each under a Post Captain, the enrolment of the Sea Militia by districts, the establishment along the coasts of Alarm Posts, Depôts of arms and stores, the provision of boats, and the arrangements for periodical drills.

At that time 26,000 Sea Fencibles, and 3,000 boats were enrolled, and this number would suffice now.

As the fishing population numbers 122,000, there should be no difficulty in raising a sufficient Sea Militia, and boats enough will be forthcoming, for upwards of 20,000 are certificated and on the Register.

It is not necessary to say anything respecting gun- and torpedo-boats, you are familiar with them, and I believe the Navy List comprises a considerable number of both, though not enough; but all maritime nations assign importance to them as factors in naval defence, and even a nation so little maritime as Germany contemplates large expenditure on this means of defence. According to an announcement in the "Morning Post" of the 1st instant, she proposes to spend 18,790,000 marks for the construction of seventy torpedo-boats and the establishment of submarine mines along the coast of the Baltic.

With regard to Coast Defence vessels I would remark that they should mount the heaviest guns, but need only be partially armoured, and as their rôle should be strictly local, they should have little more than steam power sufficient to enable them to alter position; if they have steam power sufficient for coast operations, there is a danger of their being withdrawn from their special localities in time of emergency to take part in offensive operations; once withdrawn it is likely enough that they will never be returned, at any rate the places from which they are withdrawn will be open to attack in their absence, and the gap left by them in the chain may jeopardize the other portion of the Defences.

In 1805 the defence of our South-East coast was entrusted to special vessels not being line of battle ships, and thirty vessels were told off for it, the Thames, too, was provided for specially with ten gunboats and forty barges. Of course in the days when steam was not,—defence was more local and provided for more by local means.

But the measures for the defence of our Vulnerable Points which we have been considering are after all passive, and though they will free the Fleet from anxiety with respect to these points, and give it liberty of action elsewhere, they afford it little or no real assistance—in some, a vessel or two may find shelter in case of necessity, and in nearly all



may find coal; but it is absolutely necessary to provide on all coasts a sufficiency of Strategic Harbours, *i.e.*, Harbours in convenient positions, easy of access and well defended, in which our Coast Defence fleet may find shelter, and the means of coaling, and of at least partial refitting, and in which no enemy can leave even an inferior force without detaching largely to observe it.

Our South coast is well provided with such Harbours; on it are Portsmouth, Portland, and Plymouth, and with very little expenditure, Falmouth may be added to the list; in fact, Falmouth, if necessary, may be easily formed into a strong intrenched naval camp. On the West coast is Milford Haven, and a small outlay will render Holyhead secure; but on the East coast, and this is perhaps our most vulnerable coast, there is *absolutely no place of refuge*;—in a coast-line of 560 miles, *i.e.*, between Dover and the Firth of Forth, there is no harbour accessible in all weathers. Harwich is strongly fortified, but its harbour is limited in extent, and can be made only in certain weathers. Moreover, it has not sufficient water for an ironclad of the first class; it has only 16 feet at low water with a 12 feet rise of tide.

Yarmouth Roads are shoaling, St. Nicholas Gateway no longer exists for large vessels, and in Cockle Gateway, the only access to the Roads now practicable, there are patches of 23 feet, and the rise of tide is but 6 feet. The Humber lies open to the sea and is not safe for coaling in easterly weather. The Tyne is impracticable for large draught vessels. A Strategic Harbour of refuge is absolutely necessary upon the East Coast, and no scheme of national defence is complete that does not embrace the formation of such a Harbour.

The commerce on this coast has developed enormously of late years, and last year reached the very large total of 17,581,245 tons; yet, in spite of its importance, its national importance, it is absolutely without protection and lies immediately exposed to the two most ambitious and most aggressive Powers of modern times.

Some will say that Kiel and Wilhelmshafen are defensive measures, undertaken as a counterpoise to Cronstadt and Sveaborg. I have no desire that the relations between these two Powers should be other than friendly, but I do not desire to see them combined for aggressive purposes, and I cannot ignore the possibility. In my view the main object of Wilhelmshafen is aggressive. I do not assert that the originator of this fortified port set this object distinctly before him when he first planned it, but I have no doubt but that the facilities it would afford for aggression, in the event of war with nations to the westward of it, did not escape him. Anyhow, there it is; we know how the facilities for action induce action; and we should place a counterpoise to it on the East Coast, following the same wise policy which led us to place Portland on the South Coast as a counterpoise to Cherbourg.

The particular locality for this counterpoise I leave to naval men, but it should be central between the Thames and the Forth, and on military grounds Filey will suit well enough.

It has been stated in this theatre that for something less than 1,000,000*l.* what is wanted can be done at Filey, and we shall fail in

our duty to those who come after us if we do not find the means to undertake the work forthwith.

Wilhelmshafen was commenced in 1854, when German commerce was comparatively trifling and the German marine insignificant. Since then great engineering difficulties have been overcome, and a very large sum, perhaps more than three times what is estimated as necessary for Filey Harbour, has been spent at Wilhelmshafen.

At Wilhelmshafen there is more wharfage facility for embarking and disembarking troops and munitions of war than in all our dockyards put together.

While on this coast let us turn to Dover. The advantages of Dover as a Military Harbour are obvious to all military and naval men; but as the impolicy of leaving it in its present unfinished state has at last been recognized and the completion is now being undertaken, I content myself with pointing out how admirably fitted Dover is, by its position at the most salient point of the South-East and South coasts, where the waters which separate us from our Continental friends are narrowest, for an advanced Post of Observation, from whence we can most readily prevent a junction of hostile fleets advancing from the west and from the north to undertake a combined offensive operation; in fact, a fleet encamped at Dover would hold the entrance to the English Channel from the North Sea, and to the North Sea from the English Channel.

But Dover is of great commercial importance as a Port of rest and departure for our merchant shipping, and should on that account alone be extended to the dimension of a secure harbour.

Some say, why spend money on Dover when you have a secure anchorage in the Downs, only 6 miles off? That is a fair question, and I take the opportunity to ask it here in order to answer it. The answer is, that ships sheltering in the Downs are beyond the protection of batteries on shore.

Having done so much, we were bound to complete the harbour of Dover, and I am heartily glad that the reproach of its unfinished state is to be taken from us.

Perhaps the naval combination which would be most deadly to us would be France, Russia, and Germany; in the event of such a combination, the importance of Dover cannot be overrated; from it we can interpose to prevent a junction of the three fleets, and can bar the passage of the fleets of the latter two to the westward.

Dover secures the right flank of our East coast front; let us examine what are the natural facilities for securing the left flank of this front.

The sea route by the north is through the Pentland Straits, a narrow channel, about 5 miles in width, between the northern point of Scotland, Duncansby Head, and the Orkneys; in the Orkneys is an excellent and extensive anchorage, called Long Hope Sound, much resorted to by fishing craft in all weathers. Here-by pass the returning whaling fleets bound for Peterhead and other northern ports, and here-to come in crowds the herring fishers of the north, a hardy and skilful race of seamen. This Sound, which is easily defended, has always received attention, and has still upon its shores the remains of

past protecting works—works which may easily be rebuilt to meet the necessities of the present time. With this Sound securely held, and Thurso and Wick on the opposite mainland defended, what better Post of Observation could we desire? The straits would be easily blocked, and an enemy's fleet, essaying to pass to the westward, forced into the inclement waters which wash the north.

The West coast of England does not need much. Milford Haven and the Severn are defended, though the latter should have some additions made to its defences, and Liverpool has, besides older works, the strongest battery of its class in existence; more remains to be done here, but there is already a very good groundwork.

To place this Coast in security it will probably suffice to construct Works to bar the entrance to the Clyde, and such Works may be constructed at no very inordinate cost, and to defend the Harbour of Refuge at Holyhead; this Harbour is well worth a moderate expenditure for protecting Works, it is the third harbour in respect of size in the kingdom, it is in the direct track of St. George's Channel traffic, and of the foreign trade flowing in and out of Liverpool, it is also the most important link in the chain of connection between England and Ireland.

On this Coast, the Scilly Isles would form an excellent Post of Observation, and the old works there should be remodelled and rearmed to protect the swift cruisers which should be detached there for observing duties.

Turning to Ireland, we have an excellent harbour on the South coast, very strongly defended, the Military Harbour of Cork. Here is a Naval Establishment of considerable, if not of first rate, importance; there is, however, very little defence for the rest of Ireland, though the coast, especially on the western side, is difficult of access, and presents unusual facilities for effective defence at moderate cost. This state of things should not be allowed to continue, the absence of collateral defence diminishes the value of the works at Cork Harbour. Upon the south coast it may be sufficient to modernize and re-arm the works at Waterford and Kinsale, and no great expenditure need be incurred.

A glance at the East coast will show that if a strong place be formed at Waterford in the south and another at Belfast in the north, over against Milford Haven and the Clyde respectively, no enemy except with a great preponderance of force would venture into the St. George's Channel, or if he did venture, he would do so at considerable risk if any British fleet swam upon the home waters.

Moreover, if Dublin were adequately defended, there would not be much to tempt him, argosies of costly price within the Channel would run to Holyhead, to Liverpool, or to Dublin for shelter, and there would be little difficulty in warning or turning away the homeward-bound merchantmen, before they reached the entrance to the Channel. Upon the Northern coast the harbours of Lough Swilly and Lough Foyle may be easily defended, and should be; the former is capacious and available for vessels of the largest size, and both should be denied to an enemy; fortunately there is no great difficulty in the

case of either. Lough Swilly would shelter a considerable squadron, and both would be excellent places of resort for single cruisers. On the shores of both are works of no very remote date, which should be modernized and re-armed. Upon the West coast a central Harbour of Refuge would be most acceptable for local coasting purposes, but in spite of all that has been put forward, at one time in favour of Galway, at another in favour of Valentia, Tralee, or Bantry, I cannot but admit to myself that the distance by sea to Liverpool, Bristol, or London is in point of time so little more, that the finest harbour in the world here would little tempt merchants to it, penalized as the use of it would be by a double shipment.

However, this coast has other excellent anchorages besides those I have mentioned, pre-eminent among which are Bantry Bay, defended in past times with extensive works in strong and well-selected positions,—and the Shannon which is navigable as far as Limerick for vessels of considerable size, and for 150 miles above Limerick for steamers and barges. Towards its mouth the Shannon has water deep enough for the largest vessels, and is very easy of access; there are excellent positions for defence upon its shores, and works at present occupy these positions, which are of good trace and may be easily developed if considered necessary.

Ireland, however, is a poor country, and does not possess many resources for an invading army, and an enemy would go thither only to obtain a *piel à terre*, from which to harass and invade England.

Having considered the defensive measures which should be adopted for the protection of our Vulnerable Points, and for the general security of the coast-line, let us devote a little space to the armed men required to give life to these defences; and after all this is the greatest difficulty; money will make Fortifications but will not give us men.

The regular Army, including 61,641 in India, numbers 189,252, distributed thus—in England, 67,000; Ireland, 27,000; foreign stations, 22,000.

The Militia numbers 143,000—the Yeomanry, 14,000; the Volunteers, 248,000.

In all 584,252; at least, that is the total of the Establishments, in reality the Effectives are 82,000 less.

The Reserves<sup>1</sup> number 31,000 1st Class, 1,500 2nd Class, and 7,500 Pensioners.

I advocate, as will appear in the following paper, a local army for India, and this might under present conditions of enlistment give us 62,000 additional soldiers for general purposes elsewhere; nevertheless, we in England could count upon a part only of these additional soldiers, because in the event of war with a first class naval Power, at least 40,000 additional soldiers would be required to strengthen our garrisons abroad to a satisfactory war footing.

Perhaps by drawing upon the native troops of our Indian Army we might reduce the number somewhat, and we might so gain 35,000 Regulars for the standards at home.

<sup>1</sup> The Effectives are 19,687 1st Class, 9,693 2nd Class.

The numbers available for home defence<sup>1</sup> would be 102,000 Regulars, 32,000 Reserve, 118,000 Militia, 11,000 Yeomanry, and 207,000 Volunteers, in all 470,000.

For the garrisons of the Arsenals and Military Ports about 90,000 men are required—thus made up, 18,000 Regulars, 28,000 Pensioners, 30,000 Militia, and 14,000 Volunteers.

So that we have left 84,000 Regulars, 88,000 Militia, and 140,000 Volunteers available for field and coast service; but of these 4,000 Regulars, 8,000 Militia, and 6,000 Volunteers must be deducted for the Commercial Ports which it is proposed to defend; and there remains for the field army 80,000 Regulars, and 80,000 Militia, 160,000 men in all; while the coast army would consist of 100,000 Volunteers.

It would thus be impossible to put eight army corps on a war footing, and the only resource would be to put the corps about London and that nearest the threatened point on war footing, and this would absorb 140,000 out of the 160,000 men of the field army, leaving 63,000<sup>2</sup> men, including the Reserve and Yeomanry, for the remaining four army corps.

But this, insufficient as it is, is based upon the assumption of a local army for India, and that the 62,000 men of the home army at present absorbed in that country will still be retained on the muster rolls.

In other words, that the regular forces will be increased by 62,000 men.

Without such an increase, the Army remaining at its present establishment, and the distribution to garrisons abroad at the figures given, which it must, I think, be admitted are by no means excessive, only 29,000 regulars would remain available for the field army at home. Of course the troops drafted to garrisons abroad might be made up in part of Militia reserves, infantry, and artillery as far as they go, and by so much would the regular field army be increased; but, taking credit for 13,000 temporarily employed in Egypt, we should need 80,000 additional troops for home defence.

It is in vain to look for them to any expansion of the Army organization, nor should we hope for more from the Volunteers, they can scarcely be expected to bear the strain of a prolonged absence from home during the expectation of an Invasion. Only a small portion of them could with advantage form part of an army in the field, and the remainder are enough for the Garrisons and the Coast Army, for which they are admirably fitted, and where they would do yeoman's service.

Our only resource seems to be the Militia. Now I cannot help feeling that the Militia has suffered from the Volunteer organization, at any rate no consideration seems to have been given to its expansion, and at the present it and the Yeomanry are 28,000 below Establishment.

<sup>1</sup> I assume that none of the 27,000 in Ireland would be available for Home Defence.

<sup>2</sup> Reserve (Establishment), 32,500; Yeomanry (Effective), 11,000.

The problem then to be solved is how are we to raise 80,000 additional Militia, 72,000 Infantry, and 8,000 Yeomanry. I set considerable store by the Yeomanry, and am not sure that the proportion of them might not with advantage be higher; they come from a better class than the Militia, they know the country in their own localities, and there only should they be employed, intimately,—they are fairly well mounted and good horsemen; they would be available for scouting and irregular duties.

No doubt many will say that 80,000 additional Militia is nothing like enough, and I admit that I would have more if I could, but expansion of the present organization might, perhaps, give us this 80,000 and the 25,000 Sea Militia, and I do not think it will give us more. This would enable us to place eight army corps in the field without encroaching on the volunteer force which would remain available for garrisons and for coast purposes.

Moreover, Continental Powers will see that we are thoroughly in earnest, that we have forces sufficient to offer a prolonged resistance, and so even the strongest will think twice before risking the passage of the Channel with the certainty of severe fighting afterwards. In short, the risks will be so great, and the result so uncertain, that it will not be worth any Power's while to make the attempt.

If what is advocated be not sufficient, what resource is left to us but Conscription, or, as some urge, Partial Conscription,—how are we to compete even now, much less in the future, with nations such as Germany or France, which enrol by conscription, armed men in the proportion of one to fifteen of their population—in the case of Germany, two-ninths larger, but not half as dense as our population, in the case of France, equal to but not more than two-fifths as dense as our population? <sup>1</sup>

Indeed, for the power of competition with these and larger nationalities, our hope lies in the integrity of Greater Britain, in that union with Great Britain of her Provinces beyond the seas which I shall advocate in a subsequent lecture.

I have placed before you briefly and in outline the form which, in my opinion, any scheme for the Defence of the United Kingdom must assume. For the moment I avoid the question of Cost, not that the Cost of what has been advocated would be excessive, on the contrary it would be moderate, very moderate for the end it is intended to compass, but because in considering a question of this kind the first thing to be considered is, What is necessary to be done?—the second, How it may be done, most effectually and most economically? Excluding the Harbours of Refuge, the Cost of the Defensive measures contemplated might be perhaps 2,500,000*l.*, but were it even greater, if it be necessary that it should be done, it should be done, and Great Britain can well afford to pay for it.

	Population.	
	Total.	Per sq. mile.
<sup>1</sup> Great Britain.....	35,262,762	..... 445
Germany .....	45,234,061	..... 213
France.....	37,405,240	..... 183



Let me recapitulate here what I advocate :—

1. The most important Commercial Ports defended.
2. Harbours of Refuge formed in two important positions.
3. A Local Army for India.
4. Addition to our Militia Force.
5. Considerable addition to our vessels for coast defence purposes and in the gun-boat and torpedo-boat portions of it.
6. A Sea Fencible or Volunteer organization in connection chiefly with the ports to be defended.
7. Organization and registry of fishermen and their boats for active service in the event of war.
8. Posts of Observation established for naval purposes.

I do not think it can be disputed that this is our proper home defence, that without some such preparation both in *matériel* and in *personnel*, the kingdom cannot be considered secure, much less strong, and certainly if we are not strong at home we cannot hope to be respected abroad.

When we regard the position of these islands we may well be amazed at the advantages nature has bestowed on them; placed where the alternations of climate are such as are most fitted to call forth the energies and to develop the physical powers of their inhabitants; surrounded by water, which, while it has protected them from aggression, has fostered and developed those nautical predilections and habits which have enabled them to master the waves, and assisted by the unparalleled resources in coal and iron at their disposal to subdue the elements to their will, until the water highways are more safe and more to be depended upon than the land highways, and it has come to pass that in their hands and for military purposes the sea has become the best Line of Communication that the greatest captain ever dreamt of.

Yes, the best Line of Communication, but the best Line of Communication is of no worth without a secure "Base of Operations." This is what I am striving for: render this "Base of Operations" secure, and then no matter what numbers other nations muster to their standards, no matter though the whole of their male populations rise in arms, we can stand serenely by, careful only to interpose in the interests of humanity and justice, and then speaking with a voice that must command attention.

The security of our Coast-line has ever been a matter of great interest in this country. I have been unable to ascertain with precision what took place prior to 1100; but about 1208 A.D., King John undertook certain defensive precautions: he had quarrelled with Pope Innocent, who in return had placed the land under interdict, and that failing of the anticipated effect, had excommunicated him, and to carry out his intention had proclaimed a crusade against him, and had committed the execution of the sentence to Philip of France.

King John's greatest defensive measure was the Fortification of Portsmouth Dockyard, which he surrounded with a wall; he also established Alarm Posts along the coast, in conformity with the practice in force before his reign; these Alarm Posts were provided with

lanterns, of use at night, and were rallying points for the male population, upon which they collected with such arms as they could procure to repel the invader.

Something of this nature Scott has depicted in the "Lady of the Lake":—

"Fast as the fatal symbol flies  
In arms the huts and hamlets rise,  
From winding glen, from upland brown,  
They poured, each hardy tenant, down;  
The fisherman forsook the strand,  
The swarthy smith took dirk and brand,—  
With changed cheer the mower blithe  
Left in the half-cut swathe the scythe,—  
The herds without a keeper strayed,  
The plough was in mid furrow stayed;—  
The falconer tossed hawk away,  
The hunter left the stag at bay.  
Prompt at the signal of alarms—  
Each son of Alpine rushed to arms."

*Canto 3-14.*

The last recorded instance of the use of these beacons is in 1804, when a beacon was accidentally lighted at Hume Castle, in Berwickshire, and the alarm spreading through the south coasts of Scotland drew out the Scottish Volunteers, who had been enrolled a short time previously in view of the possibility of a French invasion; and here I may remark that these Scotch Volunteers turned out with wonderful celerity.

From the time of John to the time of Henry VIII isolated efforts seem to have been made, and fortresses erected here and there upon the coast, as local terrors and local interests prompted. Dover was taken and partly burnt by Montmorenci in 1296, in Edward I's reign; but we know that it was in existence long before. In Edward IV's reign the towers at the Haven's Mouth at Portsmouth, probably Point Battery and Blockhouse, were begun, they were set forward in building by Richard III, and ended by Henry VII. Henry VIII, who was sagacious and prompt of action, taught by the descents<sup>1</sup> of the French upon our coasts, did consider seriously the necessity of fortifying in a permanent manner the most Vulnerable Parts of the coast, and in 1539 caused "the Havens to be fenced with bulwarks and blockhouses, and sent Commissions to have general musters made throughout the realm, having been informed that the Pope had moved and stirred divers great princes and potentates of Christendom to invade the realm." But Henry not only sent Commissioners, but rode himself towards the sea-coast to survey all the ports and places of danger on the coast where meet and convenient landing-places might be doubted, and he caused bulwarks and forts to be erected in these dangerous places.

The most notable of these were in—

<sup>1</sup> Such as the descent of Prégent upon the Sussex coast in 1513 and 1514, and upon the Isle of Wight in 1545.

Kent:—Dover—Archcliffe, Castle and Dover Cliff bulwarks; Downs—Deal, Walmer, Sandhill, castles and batteries (5), near Deal, Sandgate Castle, Queenboro' Castle, Gravesend, Milton, and Higham Bulwarks.

Sussex:—Comber Castle near Winchelsea, on site of a still older work, cost 23,000*l.*, 1539-40.

Cornwall:—Falmouth—Pendennis; St. Mawes Castles.

Southampton:—Town and Isle of Portsmouth—Semaphore Tower (?); South (sea ?)—Hasellwood Point, and Calshott.

Isle of Wight:—Hurst, Yarmouth, and Carisbrooke Castles; also St. Andrews, Standhamtaye and St. Elius Castles, and Shapwood (probably Fort Albert) Bulwark.

Dorset:—Portland and Sandsfoot Castles.

York:—Hull Castle.

Essex:—Harwich, Langer Point, St. Osithe's, Mersea, and Brakell-sea, Tilbury and West Tilbury.

There were also at Plymouth, Stonehouse Fort, Hoe Batteries, and Eastern and Western Kings.

Jersey, Alderney, and Scilly were fortified at this time.

Many of these castles remain to this day; and some, such as Walmer, Sandgate, Hurst, Pendennis, and Southsea, form part of the existing defences.

In Elizabeth's time, the country being then at war, the ridiculous inefficiency of the Navy excited apprehension, and the Queen and the able Ministers with whom she surrounded herself bestowed serious attention upon the Defences of the Coast.

The first *Royal Defence Commission* was issued in her reign, in the year 1572.

The outcome of this appears to have been a system of batteries for the defence of the Medway, Sheerness and Queenborough garrisoned, Upnor Castle built, and Milford Haven fortified—the points here selected being Pater, Dale, and Stack Rock.

Probably also Forts Essex and Rat Island, at Alderney, date from this period.

About this time we hear of forts at Newhaven, Blatchington, and Seaforth, preparations for defences at Hastings and Winchelsea, Bulver Hythe, and of the defences at Rye.

St. Nicholas, or Drake's, Island is now first noticed as a fort, and Dartmouth Castle has an armament.

A Royal Commission on the subject of Fortifications was issued in 1631, but it embraced only the defence of the Scilly Islands, previous to which there had been many war scares, two especially notable in 1624 and 1627.

In 1666 we were at war with France, Denmark, and Holland, and the House of Commons readily voted sums, unexampled in our history, to put the country into a state of defence; from this period we trace the fortifications of Portsmouth, Gosport, Isle of Wight, Weymouth, Portland, Dartmouth, Plymouth, Falmouth, Fowey, Scilly Isles, Sandown, Deal, Walmer, Sheerness, the Thames, Gravesend and Tilbury (80 guns), Woolwich, under Prince Rupert (60 guns), Land-

guard Fort, Scarborough, Hull, Bridlington Quay, Tynemouth, Holy Island, and Berwick.

In Queen Anne's reign large tracts of land were purchased whereon to erect fortifications, under an Act of Parliament passed for the purpose; this Act was the first Defence Act. These measures were designed to meet an invasion of England, projected by France in the interests of the Pretender.

In George IIrd's reign other points along the coast were fortified, notably Littlehampton, Brighton, Hastings, Folkestone, and Hythe, and Chatham and Devonport Lines.

In George IIIrd's reign additions were made to the defences of Portsmouth, and Portsea,—Hilsea Lines were thrown up, and Fort Monckton and Stokes Bay defences were constructed; Fort Cumberland was also reconstructed.

With later measures for the security of our coast-line you are all familiar, and it is unnecessary for me to enlarge upon them here; but when we reflect upon the boldness and unselfish energy of our ancestors we may well feel ashamed at our own lukewarmness, and yet the peril which stirred them to such prompt, such active measures, is still present, is nearer, and is far more deadly now than then.

We cannot fail also to note how much was done locally, the success of the measures was largely due to *decentralization*; local measures, local spirit, often supplied the materials, often supplied the money, and indeed was equal to all demands upon it—that local spirit still exists, it is notorious that several of the large Commercial Ports have offered to provide, some guns, some men, some both, for their own defence.

The Government, acting upon what is, I believe, sound policy, have hitherto declined to let the Defences pass from Public to Private control, but in declining they have incurred a grave responsibility of which they cannot divest themselves, and which we, as far as lies in our power, should urge them to meet.

What is the pith of what has been said? It is this: you, the Public, are so wealthy that you are a temptation to unscrupulous neighbours, yet you are in such a state of false security that your weakness is conspicuously evident to them. You are so indifferent that you cannot be induced to look beyond your own narrow private concerns; moreover, you are so luxurious that there is danger of your becoming enervated. What stands in the gap between you and those who covet your possessions? Nothing,—upon which you can with certainty rely. You are in danger. Lose no time in putting your house in order. Putting your house in order! Ah, how many voices, far more powerful than mine, have, from where I now stand, striven to rouse you to a sense of your danger. Where they have striven in vain, can I hope to succeed? Yet words, however humble, spoken under earnest conviction, cannot altogether fail of their mark, and haply some may be induced to give a little consideration to the expediency of putting *our* house in order. Yes, putting *our* house in order is all that is urged, and in what words can it be urged more suitably than in the words of the Prince of Peace? "When a

strong man armed keepeth his house his goods are in peace." In receiving these words, note that there are two conditions necessary, you must be strong, and you must be armed. Without you are armed your strength is but rottenness, and so, however strong you may be, in numbers, in free institutions, in habits of manly self-reliance, and in wealth, these, valuable as they are, are no protection if you are unarmed; look to your armour and your arms while you may, lest, when you least expect it, a worse thing happen to you.

The CHAIRMAN: Gentlemen, we have heard a most interesting lecture from Sir Charles Nugent—a lecture which requires no words from me to point out its exceeding value. I only wish it could be heard and carried throughout the country, in the hope that something might be done to place us in a better position as regards defence. We shall now be glad to hear the opinions of any Officers upon this subject.

General COLLINSON (retired), R.E.: I quite agree with Sir Charles Nugent that this is a most important time to bring forward the subject of the defence of the kingdom and of the Empire, because I agree with him that when we consider the present condition of Europe we cannot have much hope of peace in the future. Europe is now composed of three or four large Empires, which are continually adding smaller countries to their own, and at the same time are continually increasing their powers of making war. And this is an important consideration for our country, particularly because those Continental States are very naturally striving to increase their own trade and to get a part of that enormous trade of the world which Great Britain has to a great extent monopolized; and notwithstanding the statements of many of the Peace Society, that "commerce is the great peace promoter of the world," unfortunately the history of the past shows that, in many cases, rivalry in commerce has been the origin of some most disastrous wars. Therefore, I think that we must expect that when any great European war does occur, it will be one of the most serious wars for this country. I agree with Sir Charles Nugent in almost all the propositions which he has laid down to-day for the defence of this kingdom, only I do not think he has gone quite far enough. I think it is very important that we, in this Institution, should state very clearly and distinctly the utmost extent of what we think necessary for the defence of the country; it is almost the only means by which the public can get at the opinion of its professional advisers, and I think we should be very wrong if we understated in any way our opinion on account of any particular public or political feeling at the time. Now with respect to the defence of the United Kingdom, I agree with Sir Charles Nugent that it is most important that all those permanent fortifications which have been recommended from time to time should be completed, and that others should be added to them. I do not think anybody (in this Institution at least) would accuse me of undervaluing the importance of the naval defence of the Empire; but when one considers the work that the Navy will have to do in the time of a great war, the fleets of the enemy that will have to be met in the open sea, the vast extent of our commerce in every ocean in the world that will have to be protected, I think it would be only justice to that Service to relieve it as much as possible of the necessity of guarding our own shores, that is to say, as much as it can be relieved by land defences. I think it is not only necessary to complete those fortifications that Sir Charles Nugent has mentioned, and particularly the defences of Chatham, but also to fortify the capital, not only for the security of the capital itself, but in order to keep up the connection between the north and south of the country and between the capital and the sea. With respect to the defence of other harbours upon the coast, and particularly our mercantile harbours, the only one point that I should like to draw attention to is the providing of coaling ports for the cruisers that would have to be stationed along the coast to guard our coasting commerce against cruisers of the enemy; and I think the table that Sir Charles Nugent has given in his paper of the commerce, and particularly of the tonnage, at each of our principal ports will be a very valuable guide to naval

men in determining the position of those coaling ports, because it shows the essential parts of the coast to be defended. With respect to the defence of the coast generally, I quite agree with Sir Charles Nugent in recommending an increase of the militia, only in that case also I do not think he goes at all far enough. It was suggested to me some years ago, when I was discussing similar subjects to this, by one of the wisest soldiers I think of our day, Sir Henry Harness, R.E., the enormous advantage towards the defence of our coasts that is given to us by the invention of the breech-loading rifle; it is a similar advantage to us now to that which was given to the English infantry in the Middle Ages by the introduction of the long-bow. Like that weapon, the breech-loading rifle requires both skill and pluck to use it properly, and I think we may say, after the late battles, that neither skill nor pluck are wanting in the British people. General Harness argued that if we could have such an organization, so fully established in this country, that it would be a well-known fact throughout the world that whenever any enemy landed upon the south-east coast of England, which we consider the dangerous coast, whether by night or by day, he would be quite sure to find a few thousand expert riflemen ready to meet him—if that fact could be thoroughly well established to the world—it would do more to check the idea of invading this country than either fleets or forts. Fleets can be eluded, more particularly in these days of steam, and they were even eluded as we know in the days of sailing vessels; and forts cannot be everywhere. That is why I quite agree with Sir Charles Nugent in recommending a great addition to the militia; but to carry out any such idea would require a very much larger force than he has mentioned. In fact, the force that he mentioned would be almost entirely taken up in forming the movable army corps which you must have within the interior of the country, ready massed to meet an enemy in case he should force a landing. You could not possibly get them down to any part of the coast in time to resist him fully. Railways are not to be depended upon for such a purpose, and, therefore, I think it would be necessary to increase the force of the militia to a very large extent, so much so, in fact, that it would take a large proportion of the young able-bodied men of the country; it would, in short, be necessary that every one of the young able-bodied men of the country should be taught the use of the rifle. This is a totally different thing from conscription, for at this very moment it is the common law of the land that every man shall, when called upon, assist in the defence of his country, and if proper measures were taken to provide ranges within reach of the centres of population, there would be no taking away a man from his home for any long time except in case of invasion. I think it is very important that we should use the militia for this purpose, for that is the original national force of the kingdom. It is one that has existed from before all records, and its very name is one that expresses its real origin and intention. It is the same thing as the Roman *miles*, the *unus ex mille*—the one man out of a thousand who is selected to defend the country; and I feel sure there is still quite sufficient spirit left in the population for the young men to come forward and respond to such a call.

Captain J. C. R. COLOMB, R.M.A.: I am quite sure everyone who has given the slightest attention to this subject must feel the immense importance of the question brought before us, the opportuneness of the time, and the very able manner in which it has been treated. As I shall have more extended remarks to make upon the subsequent lecture, I shall endeavour to leave out anything mentioned in this lecture connected with the second part of this subject. It is very hard to treat the defence of the United Kingdom as a question by itself, because the United Kingdom is valueless to its people unless that greater Britain outside and that dominion of the sea which she must hold—in order to live—is maintained. Sir Charles Nugent has been kind enough to allude to a sentence of mine with regard to the Royal Commission on Defence of British Possessions and Commerce. You know, Sir Lintorn, better than anyone else, by the evidence taken on that Commission, that this country is living in a fool's paradise. Now, with regard to the special question of the commercial ports, Sir Charles Nugent, in speaking of their fall, stated that it would inflict serious loss. If there is one thing I admire more than another in the way he has treated this subject it is the temperate nature of his statements. He said the fall of these commercial centres, or some of them, would inflict serious loss.



Now, Sir, let us take one of them—I will not take London, because that is apparent—let me take Liverpool. The loss of Liverpool means the threatened starvation of a large part of the population of the United Kingdom. Through Liverpool comes an immensity of the food of this country. I was staying not long ago at Manchester, and made some inquiries from commercial men there as to what they thought the effect would be of any interference with our sea traffic and commercial harbours. I was told it was impossible. However, I said, "Assume that it is possible; remember it will certainly involve a slight rise in the price of food, and it will involve a difficulty about getting your raw material." The answer given me by every man was, "It is impossible any such interference could take place." "But," said I, "assuming it as an imaginary problem?" The replies I received were, "We should have revolution; the working-classes could not be controlled." I also believe that if those commercial ports, through which England breathes, are interfered with, you will have to face revolution at home. Our population is rapidly increasing; there is a very small margin between masses of the people and starvation, and the slightest rise in the price of food, due to being unable to get your food and raw material into those ports, means widespread and bitter discontent. I would ask the meeting to turn attention to that table of the principal commercial ports which Sir Charles Nugent has placed before us. You will see, if you take Liverpool, the Humber, or the Clyde, the aggregate tonnage entered and cleared at those three ports alone is very nearly equal to the total tonnage entered and cleared at the whole of the ports of France. I heard it stated in the House of Commons last night, and it was not contradicted, that taking only one small element of defence of commercial ports, namely, torpedo-vessels, France has eighty-two first and second class torpedo-boats, while England has only seventy-seven. Remember that fact in connection with the first three ports on that list, at which the tonnage entered and cleared is very nearly equal to the total tonnage entered and cleared at all the ports of France. Sir Charles Nugent used the phrase, "If our fleet were scattered to the winds." I maintain our fleet never will be scattered to the winds; it may be sent to the bottom; but it is not necessary that any large portion of our fleet should be scattered to the winds or sent to the bottom in order to produce the consequences to which Sir Charles Nugent referred, because, in considering measures for the defence of the sea, the immediate and primary danger to your mercantile marine is not the defeat of your fleet, but—as I have pointed out—the moral effect produced upon your Stock Exchangers and your shippers by the fact of finding out, at the first brush, that England's arrangements for its protection are inadequate. I will not trouble you with any further remarks, except with regard to one important element—the element of cost. The real difficulty of putting the Empire into a state of defence is that of money. I entirely agree with every word that Sir Charles Nugent has said, with the exception of one or two details, which I shall not now discuss. I should just like to say one word with regard to cost. I take some facts in comparison with the tonnage entered and cleared at the commercial ports, and the fact of three of our ports being equal in the entrance and clearance of tonnage to the whole of the ports of France; and I take fifty years ago—a period of profound peace—to give some idea of the cost for sea defence then and now. The defence of our commercial harbours is part of the question of sea defence. Fifty years ago, at the time of profound peace, the United Kingdom spent something less than 13*s.* on a war navy for every ton of the mercantile marine entered and cleared at home ports. France then spent in like manner 1*l.* per ton. Now, from nearly 13*s.* fifty years ago, England has dropped to a naval expenditure of only 2*s.* 6*d.* per mercantile ton entered and cleared. France also has dropped, but, although she is not dependent on the sea, she spends about 4*s.* 6*d.* for every mercantile ton entered and cleared, nearly double what we do. Now, put it very roughly in another form. Fifty years ago we spent 1*l.* in our Naval Estimates to something approaching every 1½ tons entered and cleared. France, fifty years ago, spent 1*l.* for every ton. Now we spend only 1*l.* for every 8 tons coming and going to those commercial ports, and France spends 1*l.* for

<sup>1</sup> See particularly "Naval Intelligence," &c., "Journal," vol. xxv, No. CXII.



every 4 or 5 tons. Now, Sir, if men like yourself, if men like Sir Charles Nugent, cannot obtain those necessities for security from the Government of this country, what then have we to hope for? We know how we are always met on this question. We are told that these things can be done at the time, for we shall make a prolonged resistance. I do not believe it. You will all remember Lord Overstone. There was no better nor more eminent civil, financial, and commercial authority; no man who was likely to take a calmer view of things than he. He was not prejudiced by naval theories, or what the "Times" calls "the military desire for war." Here is what he says: "Our riches, the composition and nature of our social and monetary system, the limited extent of our country, the necessity of internal order and confidence for the maintenance of our manufacturing population, would, I fear, be found to render a prolonged conflict perhaps impracticable, at all events fatal to all that constitutes the power, the well-being, and the happiness of this country." A long conflict could not take place; it must be short and decisive one way or the other, and if you are not prepared you will have no time when it comes. He concludes, as you may remember, by saying, "If we prove too apathetic to take the necessary precautions, or to make the requisite efforts, or too short-sighted and selfish to submit to the necessary sacrifice, we must bow to the fate which the whole world will declare we have deserved."

Lieutenant TUPPER, R.N.: As it is apparent that our home defences are not what they should be, it seems to me that the first thing to be done is to get at the root of the evil, and to get rid of that class which Sir Charles Nugent calls the fearless, because they are ignorant. This would seem to me to be most easily done by having this paper published at once and distributed throughout the length and breadth of the land. It ought to be in every club—political, social, working-men's—every one ought to read it, and then we might have a chance of the constituents making their members inquire into the question, and so urge the Government to spend money on our fortifications, and to extend our defences. Sir Charles Nugent says: "With regard to coast defence vessels, that they should mount the heaviest guns, but need only be partially armoured, and as their rôle should be strictly local, they should have little more steam-power than is sufficient to enable them to alter their position." That I must entirely disagree with, because if you have a vessel that can merely alter her position by steam-power now-a-days, she would quickly be rammed. You *must* have commanding speed, and if you only have vessels that will go a few knots you may just as well put your ship on shore in the shape of a fort, and in fact much better. Gunboats are the great things for coast defence, drawing very little water, getting close under batteries, and offering very small marks for the enemy to fire at. They may also have a speed of 12 knots, carry one 8" breech-loading gun, two outrigger and two Whitehead torpedoes, and be strong enough to ram. I think their number ought to be largely increased, and that they should be extended all round the coast as sentries, and what are called the coast defence vessels should cruise in squadrons of not less than three ships. These gunboats would be sufficient to hold an enemy in check, and to a certain extent prevent a landing until assistance arrived, and so will give time to telegraph to the various squadrons to reinforce fleets (for I think we should have more than one Channel fleet in case of invasion), so that they might concentrate at the spot invaded. I should also like to ask Sir Charles Nugent if he proposes any defence for the Channel Islands. They seem to be in a very important position, and nothing has been said about them.<sup>1</sup>

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<sup>1</sup> I also wish to ask Sir Charles Nugent if he will be so kind as to point out those ports, commercial and military, at which torpedo defences now exist in the shape of electro-contact and observation mines, and whether these are in position or could be rendered dangerous to an enemy in twenty-four hours, for, as far as I know, not many ports have this advantage.

If defences, such as Sir Charles Nugent advocates, are taken in hand, it would take more than a year to render them efficient, whereas in about three months, by the united efforts of the Navy and Royal Engineer Torpedo Corps, we might render our shores more secure by a complete torpedo defence.

Captain LONG, R.N. : As a sailor I should like to make a contribution to this discussion on the matter which has been so very ably brought before us. It is with regard to the question of cost. Of course it is impossible to enter into detail on an occasion of this sort, and what always occurs to me, when I hear the cost of our defences mentioned, is that line of Sir Walter Scott's, which he puts into the mouth of Marmion, where he says :—

“ Where's the coward that would not dare  
To fight for such a land ? ”

I think we might paraphrase that and say, “ Where's the miser that would not care to pay for such a land ? ” That seems to me to be very much the point in this matter. The only other question to which I wish to call your attention is the sentence in Sir Charles Nugent's summary, where he says that he advocates a “ considerable addition to our fleet of vessels for coast defence purposes, and in the gunboat and torpedo-boat portions of it.” I should like to echo what has been well said by Lieutenant Tupper, that a ship means a vessel which can go to sea and fight at sea, and I hope we shall build no ships which cannot do that. I think if the Royal Engineers consider that in any position it is impossible to mount guns effectually on shore, it would then be permissible to build small gunboats, carrying one gun each, as was advocated by Sir Edward Reed some time ago, and I cannot hope that anything I may say would carry more weight than what he said then. With regard to the torpedo-boats, Sir Charles Nugent mentions a sea fencible or volunteer organization, and the organization and registry of fishermen and their boats for active service in the event of war. Analyzing the census of 1881, and taking the coasts of this country, starting from Sheerness and going as far as Berwick only, on that portion of the coast there are 12,000 fishermen of ages varying from fifteen to forty-five. I also take the chart published by the Royal National Lifeboat Institution, which shows that on that portion of the coast there are seventy-six lifeboats. Now, I think, that wherever there is a lifeboat we might put a first-class torpedo-boat. The cost of doing that will certainly not exceed 608,000*l*. You there have an organization ; you have the men who go out whenever there is a gale of wind at the risk of their lives, to save the lives of their fellow creatures, and remembering what the Duke of Wellington said with regard to Soult, for when he was once asked whom he thought was the best General he had been opposed to, he said he thought Soult was, because he always found that whatever he had previously decided would be most inconvenient to him, was done by Soult. As a sailor, if I were ordered to go off an enemy's coast, the thing that I should think would be most inconvenient to me would be the fact that there were 100 torpedo-boats manned by first-rate men of exceptional local knowledge, and that the Government of the country had offered 1,000*l*. for the destruction of my ship, that I should consider would be exceedingly inconvenient. There is only one other point, namely, with regard to the coaling port and strategical harbour on the north-east coast. When the campaign occurred between Italy and Austria in the Adriatic, the Italian squadron, after they had been four days absent from their own port, were short of coal. That is a fact of great importance in this connection, and should our statesmen consider that the action of Continental Powers in any way menaces this country, they could not give a more statesmanlike answer to it than by placing a naval arsenal on the north-east coast close to our iron and coal districts, and to the great workshops of the north.

Captain the Hon. E. FREMANTLE, R.N. : I feel that the Navy has had more than its share in this discussion, and consequently my words will be very brief. I had thought it would be necessary for me to point out that the first part of the defence of this

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All who have manipulated torpedoes know that they require great care, and all hurry and slurring over any tests must be avoided, or at the critical moment the mines explode owing to some defect of either continuity or insulation. I therefore beg to suggest, that at various selected spots round our coast-torpedo depôts be formed, and that the mines be all fitted on the cables ready to lay down in their positions at a moment's notice. Sheds might be provided for them.

country was that of the Navy. I say that in no narrow spirit of professional prejudice, but on the broad national grounds which have been so ably set forward by the lecturer, but after what has been so clearly said by Captain Colomb on this subject, it is unnecessary for me to do more than allude to it. All here present are so fully convinced of the truth of what has been urged on us this afternoon, that the only use of this discussion must be to endeavour to place the facts before the country, and I hold that steps will be taken to have this done by the publication of this lecture in a popular form. I was rather struck by a statement made by no less a person than the Chancellor of the Exchequer last year in proposing his Budget. We do not often get much help from the Chancellor of the Exchequer, but on that occasion, if I recollect rightly, he stated that the expense of the two great spending services, the Army and the Navy, was not so great now as it had been twenty years ago. That is a most important fact, when we take into consideration the very great increase of the wealth and commerce of this country, which has been recently set before us. I had the curiosity this morning, bearing that statement in mind, to look over a few of the old estimates, and I find that the estimate for last year for the Army and Navy, although we are in a state, as we have been told, of danger of war, although we have these large interests to protect, and although we actually have warlike expeditions in different parts of the globe, was only 26,359,000*l.*, 10,752,300*l.* for the Navy and 15,600,000*l.* for the Army. I find that twenty years ago the estimates on the average came to very nearly the same, the Navy nearly 11,000,000*l.* and the Army 15,000,000*l.*, but I find that in 1860-61 they amounted to 27,678,000*l.*, namely, 12,836,000*l.* for the Navy and 14,842,000*l.* for the Army. I think it is important to call attention to that fact, that whereas the Navy expenses have considerably decreased, there seems to be no sufficient cause for it. I certainly cannot myself see sufficient cause for it, when we know the great extra expenditures which are forced upon us, not only by the action of foreign nations but by the scientific inventions of the age, when we see the number of torpedo-boats in the possession of foreign Powers which were put before the House of Commons last night—I think the French number stated was eighty-two, and not eighty-eight, as stated by a former speaker, and the Russian number 100. I have myself had the opportunity of seeing those magnificent torpedo-boats, in many cases superior to anything we have in this country, going out to foreign nations; and when we come to consider the great expense naturally incurred in all these modern inventions—machine-guns, electric lights, and other expensive items of modern armament—I think if these facts could be got home to the simple notions even of the plainest man in England, he would see that there is no sufficient reason why the estimates should be so small, whether of the Army or the Navy.

Admiral BORS: Although the Navy has had the predominance in this discussion, still I venture to rise to bring forward one subject particularly which is scarcely mentioned in the paper. It has reference to the manning of these defences by the sea militia. Now I am not certain that a corresponding force is not comprehended in one of the classes of our Naval Reserve. Certainly, I think, by some expansion of our naval reserves, we might bring in the numbers that Sir Charles Nugent gives for his sea militia, and organize them somewhat on his plan. But there is another body of men whom it would be a mistake to ignore altogether. I allude to the Royal Naval Artillery Volunteers, for I am sure it would be a great error in organizing a force for the defence of home ports not to take advantage of the willing service of a very large body of men dwelling on our coasts, who, although not actually seamen, have a strong proclivity for seafaring occupations. In order to man the defence ships and gunboats proposed, we do not want trained seamen—we do not want a man who can lay out on a yard-arm in a gale of wind—but we want a man who has had a few months' drill, who can pull an oar, perhaps take the helm to steer his gunboat, and especially we want a man who can take any number at the gun he has to work. I maintain this is a duty that any intelligent individual can be taught to perform in the course of a very few months if the opportunity be given him; and I do think it is really a pity that the Royal Naval Artillery Volunteers (as they are called, although it would be more correct to style them Royal Marine Artillery Volunteers) should not receive more encouragement than they now have. Some of the original promoters did receive acknowledgment some

time ago: they were given distinctions and honours, but since that time the force seems to have been left to itself, and if they are so left I am very much afraid that they will drop off altogether. They get no capitation grant. Their services should be made use of, and they would be found to be as useful an auxiliary to the Royal Navy as the shore volunteers are to the Regular Army. Lieutenant Tupper made some observations with regard to the defence ships with which I agree to a certain extent. Anyone going round the coast will see that we have certain ports which cannot be defended efficiently by land unless at very great expense. In those cases the coast defence ships would be necessary; they should possess a certain amount of sea-going qualities, should be able to go out to meet the enemy, to co-operate with the forts, to have sufficient speed to take up a position to attack or for avoiding an enemy, and to take advantage of the ram if opportunity arises—say a speed of ten knots. Sir Charles Nugent proposes that they should be armed with the heaviest guns. I think that is unnecessary. I think the 18-ton B.L. gun of the present day would be a quite sufficiently powerful gun for the defence ships. With regard to the gunboats, I will say no more at present than that there are certainly places where they are necessary, and they should be adapted for the waters in which they would be required to operate.

The CHAIRMAN: I will venture to make a few observations upon the paper before the discussion closes, and I do so because I think it is of very great importance that, if possible, this subject should be brought clearly before the public. I am not going to enter into details, but to treat generally a few of the main points which strike me as bearing upon this very important question. First, I would observe that the result on my mind of the discussions that have gone on for many months—I might say for years—as to the condition of our Navy has been this, that other Powers have increased their naval forces and their naval strength so much that they approach dangerously near to the power that we possess on the sea. We have first-rate seamen, we have good gunners, we have good engineers to work our engines, and we can supplement our *personnel*, I have not the slightest doubt, if necessary, from our mercantile marine; but all these are of no avail unless we have ships in sufficient number and in fair condition to meet any possible foes that might act against us. In olden times, I believe, the principle adopted in determining the proportion of ships which this country should keep up was, that we should be as strong in ships as any two of the great maritime Powers of Europe. If that principle be correct, as I believe it to be, we ought to maintain that strength as a minimum, because two of the naval Powers may combine against us, in which case no sane person would consider it an excess of power for us to be able to place in commission ships equal in number and power to those which might be brought against us by our opponents. If this principle be sound and the facts be as I have stated them, then there can be little or no doubt that we have let our fleet-power run dangerously down. That being the case, and especially considering that we have a very small fleet in comparison with the work it will have to do, I think it is essential for us to place our coast in a secure state; and not only our coast, but I would go a great deal further, only that this lecture is limited to our home defences, and a lecture is coming afterwards having reference to Greater Britain, which extends all over the world. It is of the greatest importance that our ships should be set free by all the really dangerous points on our coasts being thoroughly protected by defences on shore. I do not believe in ships patrolling the seas and keeping an enemy away. It is quite true as regards operations on the sea as it is as regards operations on land, that distribution is weakness. If you disseminate your forces in all directions, and by scattering them attempt to patrol the seas too much, you will be weak everywhere, and, as a probable consequence, beaten everywhere. What is required is concentration of your forces, if you are to be strong. This principle holds good on land, and I think it does on the sea; well, then, that being the case, I think that our great arsenals should be put into a thorough state of defence, so that when our ships are away on an expedition they may feel that they have safe places to fall back upon in which to refit and recoil. Our military ports are not—and I beg to state that most distinctly, as having been for some years in a responsible office in connection with them—are not in a proper state to admit of a thorough defence. I say it advisedly, because when the defences of these

places were planned a fit of economy came over the Government then in power: they had not the heart and the pluck to have the work thoroughly done, and rather than ask the country for the necessary means, most important sections of those defences were cut out, and so holes have been left, as it were, in them, and some of these important naval arsenals are defended much in the same way as you would protect Hyde Park, by putting a fence all the way round, with the exception of a quarter of a mile, where there would be no fence. That is really the state of some of our fortresses. I think there should be no delay in completing the works and their armaments, placing them in proper condition for defence. As regards our commercial ports and our defences generally, I quite agree with what Sir Charles Nugent has said, that we are living in a fool's paradise. When it is considered that in this country we have at the best season of the year, in general, only a food supply equal to six months' consumption, that is in the autumn, and that frequently it is reduced to what would only suffice for two or three months, and not long ago I know that this was so, I think you will agree with me that we ought not to stint ourselves as to any of the means that are necessary to place the country in a proper state of defence. If we cannot get our food, if our commercial cargoes are not protected, if our ships have not secure harbours to run to and in which they can discharge their cargoes, how are we to get on? If a single hostile cruiser, as might happen with regard to some of our important commercial harbours, could bombard them and destroy the ships and property they contain, how should we get our food? and be it observed, if we cannot obtain our food supplies from across the seas, we should soon be much in the same condition as Paris was after it had been blockaded for three months; in fact, long before then we should probably be on our knees suing for peace, and ready to pay any indemnity the enemy might choose to put upon us. In illustration, I will mention a fact which came to my notice some years ago, and which gave rise to the erection of the defences, such as they are (although they are very imperfect, what there are are good, but they are insufficient), for the defence of the Firth of Forth. A deputation came to London from the city authorities of Edinburgh—I think the Lord Provost headed the deputation—and pointed out that there were no defences to protect the Port of Leith and no means for securing Edinburgh against bombardment; that there were 2,000,000 of gold constantly in the cellars of the various banks, and that if a single cruiser appeared off it, in the absence of Her Majesty's ships to keep it away, they had only to demand these 2,000,000*l.* under a threat of bombardment, and it would be a very serious matter indeed to refuse the demand. That was not a comfortable position for any mercantile port to be in; at the same time a single ship could have destroyed all the vessels in the Port of Leith. You will agree with me, I think, that this was not a satisfactory state of things. The defences are a little better now, but still they are not in the condition in which we should like to see those of an important commercial harbour. As another instance, I will mention that I once was going down the Humber in a small steamer, when there was a foreign ironclad ship-of-war trying her speed. There was a training-ship for boys, I believe, further up the river, but this powerful ironclad was steaming down past Grimsby, and I thought to myself what would have happened if this ship had been where it was in a time of war? There was nothing to prevent her being there if she had not chanced to meet a ship as powerful as herself while at sea; and I thought her Captain might certainly have amused himself by destroying the warehouses and ships in Grimsby, if he could not have gone up to Hull and done the same there. I do not think that these reflections are by any means comfortable, but I am stating these facts because I think it is necessary and advisable that the public should thoroughly understand them; it is by the knowledge of facts like these that we may hope to raise a public opinion which will bring its influence to bear upon Parliament and compel it to grant the money necessary for placing our important commercial ports in a state of reasonable security. Gentlemen, I served on the Royal Commission to which Captain Colomb has alluded, and of which he said that it "is a great public instructor, it collects authentic facts, and by their subsequent publication knowledge is increased and attention awakened." We took a vast deal of evidence, we laboured very hard at it. My lips are sealed as to what our recommendations were, and therefore I am sorry I cannot tell them to you, and I do not think it would be wise if our

proceedings were published ; but this I can say, that not one single step has been taken hitherto, so far as I am aware, to do one single thing that we recommended. Previous to the appointment of that Commission there had been a serious scare, during which I was responsible, as Inspector-General of Fortifications, for the defences—I won't say responsible for the defences—but responsible for advising as to the defences, which is a totally different thing, and I must say I could hardly sleep in my bed at night thinking of the condition of our defences all over the world. The late Government appointed a Committee, of which I was a member, and we set to work to extemporize defences. But extemporized defences, although they were the best we could do at the moment, are utterly inadequate to resist the powerful attack of heavy ships, and they were merely a sort of *pis aller* for want of better. They were erected, but there they remain. Unfortunately nothing has been done since ; and this is greatly to be regretted. Before the late Government went out of office, they knew that we were living—perhaps they would not accept the term, in a fool's paradise—but they knew that we were in a very critical position, and they appointed a Royal Commission. The present Government, when they came into office, also recognized the fact that we were in a very unsatisfactory condition, and they reappointed that Commission, with fresh members upon it, and therefore they cannot plead ignorance as to the existing state of things, which is now as it was then as regards our defences abroad. But what is the condition of things as regards our home defences ? The late Government had decided to appoint a Royal Commission to consider the question of the home defences ; but the general election came on, and the Commission was not appointed. On the present Government coming into office they recognized the danger of the present condition of our home ports, and at once nominated a Committee, but very little, if anything, has been done as the result of the labours of that Committee. I do not see that any money is taken in the Estimates this year to do anything, except perhaps a little paint, as it were, to be laid on here and there, and which may lead the public to believe that something is being done. That is the real state of things as regards these defences ; both the present and the late Governments have recognized and acknowledged that they are in an imperfect state, and therefore it is most desirable that the public should know it, and clearly recognize the danger that is incurred. But perhaps the most important question of all in connection with the subject is that of the *personnel* to be employed in the defences. I am not going to inflict a long statement about the Army, but I must say I differ entirely, so far as I can understand them, from the figures Sir Charles Nugent has placed before us. The total strength of the Army in England on the 1st of January was 90,000 regular troops. There are at the present time about 34,500 men in the first class reserve ; of other reserves there are 7,000 ; and there is a militia reserve of 26,000. If we add those together, you get 157,500 as what may be called the regular army, when every man is called out *on emergency*. From this total, however, we must deduct all sick men and men under six months' service—about 23,000 in all—which will reduce the total of troops in the United Kingdom, when all are called out, to about 134,000 men. And now with regard to the militia. Its strength according to the establishment is 142,000 of all ranks ; but the actual strength on the 1st of January was 107,000—that is to say, the militia was deficient in its numbers to the extent of 35,000 men. Well, if you deduct from 107,000 26,000 men of the militia reserve, which I have counted among the regular army—if you deduct also absentees and deserters, who at the training of last year numbered 11,000—if you deduct recruits under six months' service, who cannot be considered as trained soldiers, about 18,000—that is to say, if you deduct 55,000 from 107,000, there remain 52,000 as the total force of the militia that can be depended upon at the present moment in case of war. Well, now take these two figures together, and then compare them with what has to be done by the army and militia in the event of a purely defensive war. We have got 134,000 and 52,000, together making 186,000 men. Sir Charles Nugent tells us the garrisons abroad would require 40,000 men to complete them, that our arsenals and military ports will require 18,000 regular troops, under the assumption that their defence will be provided for to the greatest possible extent by volunteers, in addition to 28,000 pensioners and 30,000 militia. The commercial ports will require as a nucleus for



their defence to assist volunteers 4,000 regulars and 8,000 militia ; all these taken together amount to 128,000. Taking that number from 186,000 and there will remain 58,000 for the whole of our movable army, after providing for the necessary defence of our more important sea fortresses. Well, that is not a large force ; and I maintain that, taking the militia and army together, the available forces of Great Britain are totally inadequate for our defence. The chief defence of this country, after all, must come to this : If a hostile fleet should obtain the command of the Channel for a few days, a force of 100,000 or 120,000 men might be landed on our coast, and perhaps a port seized as a base of operations, in which case, if there should be no adequate force put into the field to oppose that force, the national defences will crumble to the ground ; and I maintain, and I think you will all agree with me, that 58,000 men, even when aided by the volunteers, who are an admirable body, although not fully equipped and organized, are not sufficient to prevent an enemy from incurring the risk of such an operation. I will only say one word more as to a central arsenal. I cannot help thinking we are very foolish in having all our eggs in one basket. Years ago that fact was recognized by a Royal Commission, and money was provided for making an arsenal, which was to have been in Staffordshire. The money was expended for other purposes, and the arsenal was not established. One of the most important things we require is an arsenal somewhere in the manufacturing districts. If by any mischance an accident should happen at Woolwich, it would be very serious : and not only that, we had difficulty enough in embarking all the paraphernalia for that little army that went to Egypt, when we mustered only 13,000 men in line in front of the enemy ; but what should we do if we had to put a much greater force in the field ? Such a proceeding might again be necessary for service in India or elsewhere, or even in Egypt, if things go on as at present. I therefore venture to think it is very desirable that we should have another arsenal.

Captain BEDFORD PIM : You said, Sir, just now we should have to rely upon the mercantile marine for men to man the Navy ?

The CHAIRMAN : I did not say "rely," but we should probably draw on them.

Captain BEDFORD PIM : It is most important that you should be well-informed upon the matter, and therefore I may mention that the mercantile marine at this moment consists of 80 per cent. foreigners, and you cannot therefore depend upon one single man of the mercantile marine for the Navy.

The CHAIRMAN : Sir Charles Nugent will reply at the end of the discussion upon his next paper. I will, therefore, now ask you to give him a vote of thanks for the very valuable and admirable lecture he has given us.



Friday, April 4, 1884.

GENERAL SIR J. LINTORN A. SIMMONS, G.C.B., R.E., in the Chair.

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IMPERIAL DEFENCE: PART II. ABROAD.

By Colonel Sir CHARLES H. NUGENT, K.C.B., R.E.

Taking up a paper a short time ago, I read these words: "*The political position of the Colonies as members of the Empire is found unsatisfactory by some Colonial critics, who wish to see them more thoroughly incorporated with the old country;*" and then the article went on to say that "Englishmen are for the most part contented with the Colonial system as it is." If that truly represents English feeling, I for one long for a speedy change, and so I have chosen as my motto Seeley's words: "We think of Great Britain too much and of Greater Britain too little."—Seeley, chap. 3, p. 51.

In the preceding Paper I indicated the measures which appear necessary to assure the safety of Great Britain, while leaving her Seagoing Fleet full freedom of action in any way which may be best for the protection of our Commerce and for the maintenance of the independence of our Territories and Possessions abroad.

No doubt the most effectual mode of doing both would be to shut our enemy in his ports, but it takes a considerable number of vessels, even with the aid of steam, to blockade a moderate length of coast, and the tendency of naval science has been, while increasing the size, to reduce the number, of seagoing war-ships; whether this tendency is in the right direction I am not now concerned to consider, but there are certain disadvantages inherent in ships of a very large size, which require to be more than counterbalanced by the advantages to be obtained from them.

Moreover, in the matter of blockading, steam seems to be rather against us, as blockaders, for by rendering vessels independent of weather and less dependent upon seamanship, it tends to afford equal facilities to both parties, and as during the continuance of a blockade the blockading force will be running out of coal, and losing speed by its vessels becoming foul, while the blockaded force can maintain its coal and keep its vessels clean, it will become, at last, almost an impossibility to prevent single cruisers from slipping out.

Now, superiority in speed and manœuvring power combined with weight of metal confer absolute advantage over stronger and more stoutly-armoured, but slower, vessels, and a single cruiser, therefore, in enterprising hands, may work terrible havoc among merchant shipping, even when convoyed by powerful Ironclads.

Attacks of vessels of this description may be best met by vessels of similar description, i.e., by fast-steaming merchant-vessels, which I will style "*Auxiliary Cruisers*," armed with long-ranging guns of moderate calibre. It is understood that the arrangements of the

Naval Authorities have been made to secure the use of suitable vessels;—but has the calibre of the guns been settled, and have the guns been made? This is important, as a considerable number will be required, and even the lesser-sized medium guns take some months in making.

This is carrying out upon the ocean the cardinal principle of military policy upon which our scheme of defence is based, trusting Local Defence to local means, and leaving our Fleet free to act in masses.

But be these arrangements as successful as they may, and assuming that we are able to cast aside all anxiety respecting our Home Defence, the safety of our Territories beyond the seas, and the protection of our Commerce will need all our energies.

It has been over and over again shown in this theatre how, not only our position amongst Nations, but our existence, is bound up with our Commerce, and if I refer to figures in support of this it is with a view of pointing out how the tendency is ever in the direction of relying more and more upon foreign countries for our Food, rather than of adducing facts which are well known to most of you.

In 1882 the importation of wheat reached the figure of 186 lbs.<sup>1</sup> per head of the population, the importation of flour and other grain was in quantity about as much more, and the importation of meat and meat provision was at the rate of 50 lbs. per head of the population.

The exact figures are—

	£
Wheat, 64,171,622 cwt. .... worth	33,690,105
Flour and other grain.... worth about	30,000,000
Meat and meat provision.....	35,934,221
Live cattle.....	9,214,417
Total .....	108,838,743

The rate per head of population is now 3*l.* 1*s.* 7*d.*, whereas twenty years ago it was only 1*l.* 14*s.* 5*d.*<sup>2</sup>

Now this matter of food supply is of the utmost importance; for what is to become of us if it be stopped, even for a short time? Moreover, it is likely to become year by year of more and more importance

<sup>1</sup> Value 19*s.* per head.

Other articles of food—

	£
Sugar and dried fruits.....	27,000,000
Tea, &c.....	10,000,000
Wine.....	7,000,000

£44,000,000

So that we import 153,000,000*l.* worth of food products, whereas France only depends upon foreign countries for 11,000,000*l.*—

	£	
She imports.....	54,500,000	food products.
exports.....	43,500,000	„
Difference .....	11,000,000	„

as the tendency of farming in this country is from grain to pasturage; thus, within a comparatively short period, 1,000,000<sup>1</sup> acres, about one-fourth of our grain land, has gone out of grain cultivation in England, and in the same period about 1,200,000 of root crop land in Ireland.

Precarious as is this food supply, it is rendered more so by the places whence it comes, the distance it journeys, and the number of lines by which it travels.

Take a few of the most important items—

	£	£
Wheat, United States—Atlantic.....	13,759,939	
Pacific .....	6,323,029	
Maize. Ditto.....	7,420,292	
Flour. Ditto.....	5,968,746	
		33,472,006
Wheat, Russia.....	2,168,462	
Oats,     " .....	1,975,836	
		4,144,298
Wheat, British India (10s. 6d. per cwt.)	3,844,822	
" <sup>2</sup> Australia. ....	2,108,636	
"   British North America .....	3,021,677	
		8,975,135
Oats, Sweden.....	1,241,623	
Maize, millet, Roumania .....	1,981,942	
		3,223,565
		49,815,004

You will at once notice that of this large total, which is four-fifths of the annual Importation, little more than one-fourth<sup>3</sup> is imported from our own Territories—or, the remaining one-fifth being imported in small quantities from Foreign Countries, four-fifths of our annual Imports of Cereals are derived from Foreign Countries.

This is not a felicitous condition of things, and the question arises, Is it inevitable? Some will no doubt reply that it is a consequence of the universal law of supply and demand, and cannot be altered without recourse to some form of protection, or as it is now called Fair Trade. I am the last person to advocate a departure from the

<sup>1</sup> Great Britain, land under cultivation—

	1883.	1882.
Wheat.....	2,613,147 acres.	3,003,960 acres.
Barley .....	2,442,234   "	
Oats.....	2,975,377   "	
Total....	8,030,758   "	
Potatoes....	543,456   "	

<sup>2</sup> New Zealand is far above the others in quantity and average; viz., 22·5 bushels of wheat, 28·75 oats, 22·25 barley per acre: Tasmania follows next after New South Wales.

<sup>3</sup> Last year there was a marked advance in Indian wheat, and this fraction rose to one-third; thus, the exports which in 1881 were 7,327,666 cwts., in 1882 were 11,243,497 cwts., in 1883 (ten months only) 19,500,000 cwts., of the value of 11,327,000l.—"Morning Post," 15th March, 1884.

principles of Free Trade, nevertheless, I venture to think the condition is not inevitable, and that the streams of food may, by a little management, be directed to this country, mainly, if not altogether, from our own Territories.

Let us consider what may be anticipated from India. India has unrivalled facilities for growing wheat—vast fertile plains, upon which some of the most nutritious wheat in the world is grown, and with an enormous population, living principally on millet and rice, practically an unlimited quantity of the cheapest labour, needing none of the luxuries and but little of the necessities of life.

Wheat can be raised in India at a prime cost so low that in this respect no other country can compete with it.

In 1879, 20,000,000 acres were under wheat, and produced 26,000,000 quarters, yet in the Central Provinces a new wheat-field of more than 17,000,000 acres may be found, and in the Punjab are 9,000,000 acres available for, but not now devoted to, wheat; in other parts of India also are large areas available for growing wheat; in fact, the wheat area of India is seven times as large as that of Great Britain, and we might get all the wheat we need from India.

But the wheat trade in India is restricted by the want of railway communication, and farther hampered by the price of freights<sup>1</sup>; at present there are but 10,000 miles of railway in India, and the Lines cannot carry to the seaports a tithe of the grain which may be raised. At present, however, the freights from Bombay are 14s. per ton dearer than from the United States.

I look, therefore, to an extension of the railways of India for the development of the production and exportation of wheat, and I anticipate that with the increase of exportation the price of freights will steadily fall.

Already the wheat trade of India has received great development; in 1873, 394,000 cwts. were exported, whereas in ten months of 1883 the quantity had risen to 19,500,000 cwts.

The extension of the railway system in India<sup>2</sup> is to be advocated also, and more strongly, upon military grounds, and I have no doubt but that it will receive the requisite consideration.

I have not inquired so closely into the conditions for raising wheat which obtain in the Australasian Colonies, because it does not seem that with their higher cost of labour and their greater distance for transport they should be able to compete with India.

Their capabilities, however, seem for the present illimitable, with an area of 7,000,000 acres under cultivation, of which about one-half is devoted to wheat, they raise 39,000,000 bushels; meanwhile the

<sup>1</sup> Bombay, 1*l.* 1*s.* per ton; Calcutta, 1*l.* 4*s.* per ton; United States, 7*s.* per ton; San Francisco, 1*l.* 2*s.* 6*d.* per ton.

<sup>2</sup> It is also desirable as a precautionary measure against famines, and should, by finding a ready market for the peasant proprietor, enable him by degrees to dispense with the services of the money-lender, and so relieve the cost of production of wheat by the 25 per cent. charged by the latter for the advance of seed.

The present wheat area in India is two-thirds that of the United States, nearly equal to that of Russia, and nine times that of the United Kingdom.

The price of production in the Indian markets is now 12*s.* per quarter.

unowned land exceeds 1,700,000,000 acres, of which, though a great proportion is waterless and barren, there must still be vast tracts capable of yielding wheat.

But, after all, need we look as far as India? It is true that at present India sends us nearly two and a half times as much wheat as British North America, yet in the latter country there is land about the Red River and its affluents which, if sown to wheat, would yield 125,000,000 quarters of good hard wheat. The yield there in the north is surprising; 23 to 35 bushels per acre, as compared with the yield further south, viz., 17 per acre in Illinois and 10 per acre in Kansas and Iowa.

It is proposed to gain access to this region, *via* Hudson's Bay, entering at Churchill Harbour, and thence by railway, 350 miles in length (to be made), to Lake Winnipeg, so that the distance from Liverpool to the edge of the wheat-producing area is 1,500 miles shorter than *via* Quebec, and 2,000 shorter than *via* New York.

The distances by water are—

Liverpool to Churchill Harbour, 2,926 miles; to edge of wheat district, 3,280 miles.

Liverpool to Montreal *via* Cape Race, 2,990 miles; to edge of wheat district, 4,290 miles.

Liverpool to New York, 3,040 miles; to edge of wheat district, 4,600 miles.

Already there is uninterrupted water communication, 2,384 miles in length, from the mouth of the St. Lawrence to Duluth, the great emporium for northern grain at the point of Lake Superior, and rail and water communication as far as the Saskatchewan, 100° W. longitude, with the exception of a gap of 450 miles in the line of rail between Fort William on Lake Superior and Sturgeon Falls on Lake Nipissing.

The Hudson's Bay route possesses the advantage of being so far to the North, never much south of the 60th parallel of north latitude, that it is more easily protected from attacks]from the South, while there is no chance of its being assailed from the North.

It is evident, then, that it is not absolutely necessary to look to Foreign Countries for our food supplies, we should be able to obtain all we want from our own resources, and there is this further advantage to us in this position, that when the emergency arises we are in no doubt about the sources of supply. We have both ends of the Lines of Supply in our hands and can concentrate all our energies upon keeping these Lines open.

For this purpose it is probable, I think, that steam confers certain advantages; at least, it seems to render convoy sailing more certain, and with freight steamers selected for speed, and for uniformity of speed, there may be the less occasion for fighting.

If I have dwelt upon the food portion of our Commerce, it is not that I have forgotten the other and pecuniarily far more important portion, but for the moment it occupies a secondary position; we could exist for some time if it stopped—but how long could we exist if the food supplies failed us?

I am unable to say, but I sincerely hope that such a calamity may never overtake us.

Now, though I am not of those who think that such a calamity is likely to overtake us, I cannot but admit the possibility of it, and it would not only be affectation, but it would be the height of un-wisdom to ignore it,—a difficulty faced is a difficulty already half-vanquished.

This problem of keeping the seas open is very difficult of solution. Our vessels cannot be ubiquitous, or rather ubiquity (such ubiquity, that is, as may suffice) can be obtained only by numbers, and the number of vessels in the Navy List cannot be increased to meet sudden emergency, for vessels, more particularly armoured vessels, are long of building; whereas combinations of unfriendly Nations may be effected with startling rapidity, and *there can be no more fatal economy than to suffer our Navy to fall too low.*

In one of the ablest lectures ever delivered in this theatre, General Collinson stated that the effect of such mistaken economy, in 1790, was a long-drawn war of twenty years and a debt of which we never seem to be relieved.<sup>1</sup>

But this was not all: in 1797, with all our efforts and after four years of war, we were shut up<sup>2</sup> in these islands with 280,000 men under arms, although we had a fleet of 500 vessels afloat.

The nearest approach we can make to ubiquity is *mobility*, and we should spare no expense in affording to our vessels the means of mobility; in other words, we should provide them with sufficient supplies of coal, and the best steam coal, placed in convenient positions and protected by suitable defences. It cannot be too much insisted upon that wherever coal is stored it should be protected by Fortifications, otherwise an enemy can help himself at his pleasure, and it becomes a source of absolute danger.

This points to the necessity of locating these Coaling Stations with reference also to the wants of the Mercantile Marine, and in this there should be no insurmountable difficulty, because what meets the needs of the vessel with less coal-carrying power, viz., the ironclad man-of-war, should meet the needs of the merchant-vessel with greater coal-carrying power.<sup>3</sup>

Some at least of these Coaling places, or Coaling Stations, as they are called, should also be refitting stations, where large ironclads can be docked, and these of course should be more strongly defended,—so strongly as to be beyond the reach of any but regular attack; in fact, they would be Naval Intrenched Camps, some in mid-ocean, some in our Possessions abroad, and would serve as strategical bases and points of operation for our fleets on foreign stations. Malta, Bermuda, Hong

<sup>1</sup> The same authority computes the cost of resisting the Spanish Armada at 90,000,000*l.* of our money.

<sup>2</sup> 200,000 men in England, 80,000 men in Ireland.

<sup>3</sup> Sufficient attention has not been directed to this point, and only recently I saw an announcement in the daily papers that Government had given to one of the great steam lines a concession for forming depôts of coal at Perim; this would render necessary the fortification of that island.

Kong are instances of the former; Halifax, Trincomalee (if that be the harbour finally adopted in Ceylon), and Simon's Bay of the latter.

It has been stated that an ironclad sustaining serious damage in action may not improbably be of no further service during the war. Wars in the present day do not seem to last very long, and this may be the case, but it is pretty certain to be the case if an injured vessel has to go some thousands of miles before she can be docked.

This question of Docks is very serious, and we do not stand in a good position with respect to it; many foreign yards, which sufficed for the necessities of wooden vessels, are no longer of use for ironclad vessels; moreover, in the days of wooden ships much serious damage could be,—and was,—repaired at sea, whereas in these days of iron ships only trifling repairs can be,—if they can be,—repaired at sea.

It is, however, worthy of remark that though these fitting stations must be more extensive and more costly than in the days of wooden sailing vessels, they need not be comparatively in such numbers: steam has so bridged the intervals of ocean that they may be placed with no sacrifice of efficiency further apart.

But it is necessary to make provision for the defence of our Territories abroad, not only as stations for refitting and as sources of food supply, but as integral parts of this *expanded England*, in which we can no more endure injury or loss than we can in the England within these four seas.

We should never lose sight of the fact that the nation which is at once able to put the greatest strength upon the decisive point may,—though perhaps inferior upon the whole in naval strength,—obtain so decided a superiority over her stronger antagonist at starting as to hold him at her mercy afterwards;—so much the more necessary is it for Great Britain, with most of the carrying trade of the world in her hands, that her Navy should be strong beyond rivalry, and capable of rapid expansion.

A naval war, even if waged successfully, might leave us with much of the carrying trade gone from us, and, if we may judge by the results of the American War, never to return.

The charge of the Strategical Points in mid-ocean should rightly fall upon the mother country; so also, if not wholly, in large part, should the charge for the strategical Bases, but beyond this we can do little more than afford to our Territories abroad external protection. Nor is it wise to proffer more; the larger of these Territories are willing to adopt such measures as may be necessary for local defence, and some have already done so: in Canada by the construction of Fortifications and by the enrolment of a Militia; in Australasia by the construction of Coast Batteries, by the provision of vessels for coast defence, and by the enrolment of small bodies of Permanent Artillery, and large bodies of paid Volunteer Militia, and unpaid Volunteers; at the Cape by the enrolment of a mixed force.

We can, however, be of material assistance by advice, by aid in organization, and by timely supplies of munitions of war, recollecting that what, in the advance of military science, is receding from the first position here, may suffice for military necessities there, where distance



from the centres of aggression affords some immunity from regular attack with the heaviest weapons.

Anyhow, we should see that the Vulnerable Points Abroad are beyond the reach of any but regular attack. By this course we shall be further developing the policy we have laid down for our guidance, leaving our Fleet free to act in masses wherever the occasion may require.

There is one other and very important means of Defence which should not be overlooked, I allude to Telegraphic Communication. I am not one of those who think that telegraphic communication is an unmixed blessing in military matters; on the contrary, such communication with one end of the line in the office of a War Minister who is, or who fancies himself, a genius in details—and some such there have been—may be a downright curse to either Naval or Military Commander-in-Chief, unless he is strong enough to disregard it; but if ever the law that “forewarned is forearmed” was applicable to any Nation it is applicable to this Nation, and every important refitting station should be in telegraphic communication, no matter at what cost, with England; and, farther, such Communication should be direct, or at least direct so far as not to be laid through hostile, or possibly hostile, Countries.

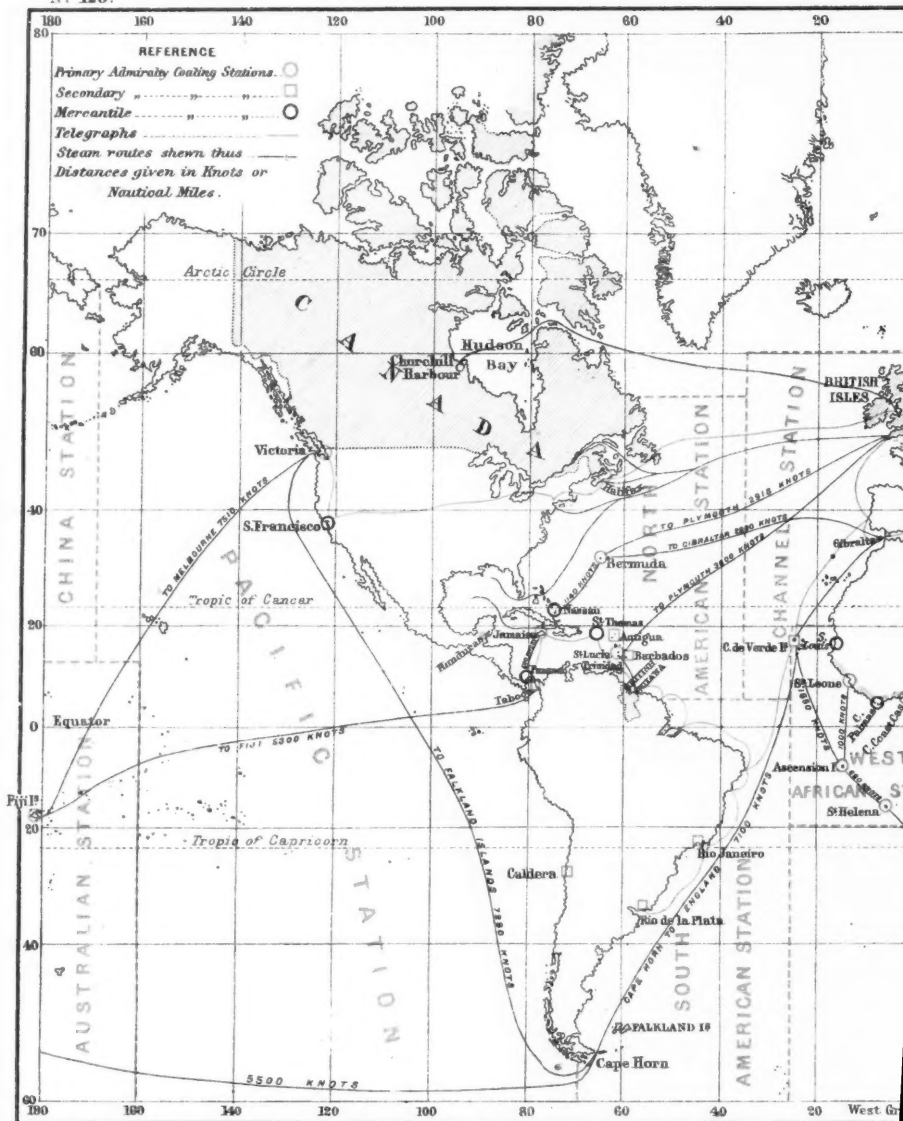
With many Stations we have already sufficient and secure Communication, but there are large gaps in the chain, and these should be filled in at once, and without reference to whether the Lines will pay; and to this purpose the surplus revenue of the Postal Telegraph Department, which at present is about 300,000*l.* per annum, might perhaps not unfitly be devoted.

Having indicated the principles upon which our defensive measures abroad should be framed, we may with advantage devote a little space to the application of them.

For Imperial purposes the waters of the world are divided into nine portions—Naval Stations we style them—and in theory at least the naval establishment of each Station is in ordinary times sufficient to safeguard the Commerce passing over its waters, and to afford support to our countrymen engaged, within the Stations’ limits, in pursuit of their legitimate occupations. These Stations are:—

		Distances from England of—	
		Nearest points.	Farthest points.
		Miles.	Miles.
1	The Channel Station.....	0	3,750
2	„ Mediterranean Station.....	1,300	4,100
3	„ North American Station.....	2,000	5,300
4	„ South „.....	3,100	7,200
5	„ Cape „.....	3,500	8,900
6	„ Indian „ <i>vid</i> Suez.....	4,100	9,350
7	„ Australian „ „.....	9,350	15,000
	„ „ „ „ Cape Horn.....	10,600	16,300
8	„ China „ „ Suez.....	9,000	13,400
9	„ Pacific „.....	7,200	7,900









Let us see how these Stations are provided with secure places for refitting.

1. The Channel Station may rely upon Home ports.

2. The Mediterranean Station, which is the direct road to India, to our Australasian territories, and to China, by the Suez Canal, is perhaps the most important of our Communications, it certainly would be the most important in the event of our being engaged in any European war; it is provided with two strongly fortified refitting Stations, viz., Gibraltar and Malta, dividing into pretty equal portions the distance between England and Port Said; and with the exception of a secure port at Port Said—Cyprus does not supply the want—nothing is wanting to this Communication.

3. The North American Station has a twofold importance: firstly, because the trade passing over it is 201,000,000<sup>1</sup>; secondly, because it will some day, through the agency of the Canadian Inter-Colonial Railway, be our best and quickest route to the North Pacific,—and by way of the Panama Canal to the mid-Pacific,—Ocean.

Here we are fairly provided for: in the North we have the fortified harbour of Halifax; in Mid-ocean we have the strongly fortified Naval Station of Bermuda; while in the South there are, amongst the West India Islands, Jamaica and Antigua, Naval Stations, fortified or in process of being fortified.

Telegraphic communication is the most pressing need of this Station; there is no such communication with Bermuda, all militarily important to us as it is; and Jamaica and our West India Islands are dependent either upon the United States, or the Havanah, for communication with England,—a Line of Submarine Cable should be laid direct to Bermuda, and thence to Jamaica and the other West India Islands.

4. On the South American Station we have only one Possession, the Falkland Islands;—these Islands, being at the extreme end of the station, are not very convenient as coaling places; but deficiencies on this Station may be made good under certain circumstances by recourse to the Coaling of the Cape Station. The Falkland Islands, however, are of importance as links in the route to the Pacific Station.

<sup>1</sup> Trade with United Kingdom—

	£
United States .....	133,000,000
America (British) .....	19,750,000
West Indies (British) .....	8,500,000
West Indies (Spanish) .....	3,750,000
Central America .....	6,500,000
<b>Total .....</b>	<b>171,500,000</b>
Trade (local)—	
North America (British) .....	24,500,000
Jamaica .....	1,500,000
Trinidad .....	3,500,000
<b>Total .....</b>	<b>29,500,000</b>
Other islands .....	8,000,000

The trade passing over this Station is 45,000,000<sup>1</sup>

5. The Cape Station extends south of the 20th parallel of south latitude westward, until it meets the South American Station in 26° west longitude: and on the eastern side of South Africa, south of the 24th parallel of south latitude, upon which parallel it touches the Indian Station, until it reaches the 95° of east longitude, where it touches the Australian Station. By this Station all the Cape, and part of the Australian and Straits trade pass. In this Station Coaling places fairly secure may be found at St. Helena and Ascension, and if necessary at Sierra Leone or Cape Coast, but such Stations would be a little out of the direct track. Looking to the French position on this coast, the Cape de Verd Islands would be a good Station.

The refitting stations on this route are at the Cape; but at Simon's Town docks are wanted, and additions to the defences to bring them up to the present date. The trade with the Cape itself is not very large, but the Station is of considerable importance, as, in the event of the Suez Canal being closed to us, a great part of the Australasian, Indian, and Chinese trade must pass this way.

The coalfields of the Cape should be developed; there is a field of steam coal in Natal, but it is some distance inland, it should be connected with the coast.

There is no Station in which direct Telegraphic Communication with England is more required. A land Line through parts of Africa, and then by submarine cable to Aden, the Mauritius, and Zanzibar, was projected, but, as far as I am aware, never carried out, and perhaps it is fortunate that it has not been carried out. What is necessary is a submarine Line from England to the Cape, with branches to the Gold Coast, Ascension, St. Helena; thence it might be extended to Mauritius, and so to Ceylon. The Government should make this, and the benefited Colonies should bear their share in proportion to their means; but no matter who pays, it should be made.

A knowledge at the Cape of what is happening in the Mediterranean may be of vital importance to the Empire, and may influence the destiny of India to an extent my hearers scarcely anticipate.

At present the Line to India passes by the Mediterranean and Red Seas, and would be anything but safe in the event of a great European war. To this Nation, to which mobility at sea is everything, the advantages of complete telegraphic communication everywhere, under its own control, cannot be overrated.

The Cape has so many difficulties to contend with, that for the present she can do little more than control her own affairs; indeed, her efforts to protect herself have cost her annually one-fourth her

<sup>1</sup> Trade with United Kingdom—

	£
Brazil .....	13,000,000
Argentine.....	4,000,000
Other countries .....	4,500,000
Peru (part of).....	6,000,000
Chili.....	7,500,000
Australia and Pacific say .....	10,000,000
Total.....	45,000,000



revenue in addition to the interest of 5,000,000*l.* raised for war purposes, but she contributes some armed strength to the resources of the Empire, and she disposes of a considerable revenue; she has a force of 3,500 regulars, but they find full occupation on the frontier. She stands with a population of only 3,000,000 over against various native races which are not only numerous, but which, unlike native races elsewhere, show no tendency to diminish in the vicinity of the white man; moreover, over against her stands a free and alien community, which has attained but a moderate measure of social development, and which, the descendants of that race from whom this territory was wrested, regard us with aversion.

6. The Indian Station is, next to the Mediterranean, the smallest Station in extent; it lies between the East Coast of Africa and the meridian of 95° east longitude, touching the Cape Station at the 22nd parallel of south latitude. With the defence of India itself we need not concern ourselves here, but may assume that it is retained in its integrity by the Indian Government; that its army is maintained at a strength adequate to the duties it has to perform;—at present its strength is 190,597;<sup>1</sup>—that such fortresses as are necessary for its land frontier are constructed, and that its Harbours are defended by works and guns of the most recent type,—though I believe a good deal is wanting here.

The Indian Station chiefly interests us as the means by which the communication with India and Ceylon is maintained, and as a connecting link in the trade with China and Australasia—outside India—which possesses a fortified harbour at Bombay with ample means for refitting; the most important point to secure is the southern outlet of the Red Sea, because through this sea, *viâ* the Suez Canal, a great part of the Indian commerce, and much of the Chinese and Australasian commerce pass—we shall not be far wrong if we estimate the latter at from one-half to two-thirds; whatever the proportion may be, it has been stated that trade to the value of over 80,000,000*l.*,<sup>2</sup> or about one-eighth of our total trade, passes through

<sup>1</sup> English Army—Europeans .....	64,509
Natives .....	126,088

Total ..... 190,587

The Armies of the Native Chiefs amount in the aggregate to 305,235 men and 5,252 guns.

In addition to the Army there are in India 64,061 British-born subjects, of whom 14,822 are in the official class, which numbers 1,506,809 males.

<sup>2</sup> Trade,—with United Kingdom—		Trade,—Local—	
India .....	£62,000,000	India .....	£76,000,000
Ceylon .....	3,000,000	Ceylon ....	6,750,000
	£65,000,000	Mauritius ..	5,000,000
Straits Settlements.....	6,250,000		
Java .....	4,250,000	Total..	87,750,000
Japan .....	3,500,000		
Philippines .....	3,750,000		
China .....	16,500,000		
Hong Kong.....	4,500,000		
Australasia .....	48,250,000		
Total .....	152,000,000		
Grand Total .....	£239,750,000		

the Canal, through which also from 12,000 to 15,000 of our soldiers are conveyed annually.

To secure the outlet of the Canal, Aden, a very strong position, has been fortified, and it has been proposed to do something at the Island of Perim; but Perim, though it undoubtedly possesses some natural advantages, has a narrow harbour, and is commanded by not very distant heights.

In these seas we have facilities for refitting in Ceylon, in the fortified harbour of Trincomalee—and Colombo, though in some respects a much less secure harbour, is receiving considerable development; the disadvantage of Trincomalee is that it lies off the direct steam track to the east, and that consequently vessels which have recourse to it lose a considerable amount of time.

Intermediately between the Cape and Ceylon, and somewhat off the route from the Cape to Australia, but in the protection of which it might be of some value, we have the Island of Mauritius with its fortified harbour of Port Louis; its value as a refitting Station, at least in its present state, has fallen very much in these days of large ironclads. Nevertheless, it is capable of some extension, and if the recent French proceedings at Madagascar had assumed the complexion they at one time threatened, its importance would have become very manifest,—in the event of the Suez Canal being closed to us, and our trade being forced to assume the Cape route, its maintenance and extension would become of paramount interest.

At any rate, if this island be not sufficient for our requirements here, we ought to take another. I would observe, however, that as long as we hold India our trade in these seas should be less disturbed than in any other seas.

From what Asiatic Power except Russia should we anticipate interference? Nevertheless the Asiatic seaboard of Russia is a long way off, and the routes therefrom may be easily blocked so as to thrust Russia as far from the Indian waters as is Europe.

European Powers intent on injury to us here must use the Cape route, and so again we need strength at the Cape.

Some indulge in the dream of a neutral canal under treaty guarantee, when, with the exception of contraband of war, commerce will flow uninterruptedly through it; as 5,750,000 tons, about four-fifths of the trade passing through the Canal, is British<sup>1</sup> this would seem very much to our advantage, but who shall decide what is contraband of war? In the event of our being engaged in a great war our enemies might declare wheat contraband of war;—and what is the value of treaty arrangements? Treaties are made for the advantage of the weak, not for the strong. The strong have no need for them, and if those who covet combine against, and are stronger than,—those who possess, no longer *beati possidentes*,—away with treaties, they are not worth the paper upon which they are written. It seems to me ridiculous to suppose otherwise; anything may be fair in war, and in a struggle for existence we should never lose an opportunity.

<sup>1</sup> The Transit dues in 1882 were 2,420,000*l*.

Again, look how easily the canal may be blocked; the malice of a single individual may do it, and what then? It may be lost to us during a whole war. No sense of holding the monopoly of the canal traffic should induce us to neglect our military establishments at the Cape.

The trade passing over this Section is 240,000,000<sup>l</sup>.

7. The Australian Station is, perhaps, the Station which calls for our most earnest attention, for while its distance renders it liable to attack and difficult to assist, its wealth and material prosperity are likely to excite the cupidity of our enemies; moreover, we are strongly interested in maintaining and drawing closer the ties which bind it to us.

Is there a nobler example of British colonization? It is peopled by a manly self-reliant race, of whom the mother country may well be proud; it has already a population of 3,000,000, which will double itself in the next twenty-five years, and an annual trade of 102,000,000<sup>l</sup>. We should spare no effort, and be prepared to make considerable sacrifices, or what some may consider sacrifices, to retain the Australasian territories as an integral part of the British Empire.

The nearest Coaling Stations to Australia are Ceylon in the Indian, and Singapore in the China Station, both are over 4,000 miles distant from the principal Station in Australia, Melbourne; but an excellent intermediate station can be found at King George's Sound, at one time used by the Peninsular and Oriental steam line. King George's Sound is 1,200 miles from Melbourne, and if used should be fortified. The Fortifications might be erected at the cost of the mother country; the neighbourhood which is poor and thinly inhabited could not at present bear the charge.

Looking to the distance of King George's Sound from the nearest Coaling Stations to its westward, it would seem that some intermediate point should be fortified. There are, however, few intermediate points from which to select.

Melbourne, which has facilities for docking the largest ironclad on the station, is protected by strong works of modern construction, and by a Harbour Defence vessel, supplemented by gun- and torpedo-boats. It is a good and secure naval position.

So also is Sydney, 650 miles to the eastward. The harbour lends itself very favourably to defence, and full advantage has been taken of this in the construction of batteries to bar the entrance, and to keep an enemy at a distance from the town. Here also there are appliances for docking vessels of the largest size.

<sup>1</sup> Trade,—with United Kingdom:—	£	Local:—	£
New South Wales .....	15,000,000		18,500,000
New Zealand .....	9,000,000		4,500,000
Queensland .....	2,250,000		4,750,000
South Australia .....	5,500,000		5,500,000
Tasmania .....	750,000		2,250,000
Victoria .....	15,250,000		17,750,000
Western Australia .....	500,000		500,000
Total .....	48,250,000		53,750,000
Grand Total .....	£102,000,000		

8. The China Station is of considerable extent, comprising the North Pacific as far as the 170th meridian of east longitude, and touching the Australian station for the most part at the 12th parallel of north latitude, but the waters of the North Pacific are nearly islandless, and our interest lies on its western shores; here we are concerned not only on account of the trade of China, Japan, and the Straits Settlements with this country, and of the large local Australasian trade,—amounting in all to 78,000,000*l.*,<sup>1</sup> but on account of the strong military position we have established at Hong Kong, whence we are able to interpose whenever the action of the Russo-Pacific force may render interposition on our part necessary.

Looking to what our countrymen are doing among the islands of the Pacific, this position of Hong Kong is of an importance which must increase steadily in the future; as the terminal of our most distant Naval Station, and face to face with an ever-watchful rival, it should be provided with exceptional resources both for its own protection and for coaling and refitting the heaviest ironclads.

General Collinson considered the value of Hong Kong had been impaired by the extension of our trade to Japan, and by the position assumed by Russia on the north-east coast of Asia, and in a less degree by the development of the United States on the north-west coast of America, and he urged, I think, that we should seek a position nearer Japan, but I am not disposed to advance 1,200 miles in that direction, at least for the present, the rather that much has been done at Hong Kong.

Possibly we might attain our end by alliance with Japan, and this may be worthy of consideration, as Japan is not only highly civilized, but densely populated, viz., 36,000,000 in an area of 148,000 square miles with a coast-line of 3,900 miles in extent.

The next Coaling Station connecting Hong Kong with Ceylon and the Indian Station, is conveniently placed at Singapore, about 1,500 miles from each. It is the centre of an important local trade, and presents considerable facilities for defence which are being extended and improved.

In this direction the China Station is well provided, but in the other and more remote direction, towards the eastern side of Australia and towards New Zealand, a Station is much required; perhaps a con-

<sup>1</sup> Trade with United Kingdom—

	£
China.....	16,500,000
Hong Kong .....	4,500,000
Straits .....	7,000,000
Japan .....	3,500,000
Philippines .....	3,750,000
Java .....	4,250,000
Total .....	39,500,000
Local Trade—	
India .....	20,500,000
Straits .....	18,000,000
Total .....	38,500,000
Grand Total .....	£78,000,000

venient position may be found in New Guinea, if it be in whole or part annexed to the Australian territories;—or some convenient island may be acquired. Torres Straits have been examined, and the islands in, or in the vicinity of, its waters, but no island has yet been found from which all the known channels can be successfully commanded.

The great lines of steamers which make use of these waters have established depôts, as yet small depôts, of coal at Thursday Island; this island is not, I believe, entirely satisfactory for military purposes, but if no more satisfactory position can be found it should be made use of, and the coal stored there placed in security; if a more satisfactory position can be found, then merchants should be induced to remove their coal to it, and measures should be taken to defend it.

At any rate the distance between Hong Kong and Sydney, about 6,000 miles, is so great that we cannot dispense with an intermediate Coaling Station.

9. The Pacific Station is the farthest from Great Britain and the widest in extent. It commences about the 70th meridian of west longitude, and includes the whole of the South Pacific as far as the 160th meridian of west longitude, and of the North Pacific as far as the 170th meridian of west longitude.

Our main concern, as far as British territory goes, is with the western seaboard of the Dominion of Canada, the naval port of Vancouver, and the coalfields in its neighbourhood. We have considerable trade with Peru and Chili, and other countries on the west coast of South America, of which a moiety passes across the Isthmus of Panama, while the other moiety with some portion of the Australasian trade passes by Cape Horn.

It has been proposed to occupy an island off the coast of Chili, and another opposite the Isthmus of Panama, and this latter would attain to some importance when the canal is cut through the isthmus, but these islands would be far apart, and we should have great difficulty in holding them in the event of a war with the United States, and as the trade with South America is not of vital importance, it may be a question whether the expense of attempting to maintain this extensive line of communication is worth the gain, and whether the squadron in these waters might not more profitably be withdrawn to strengthen the Australian and China squadrons.

At one time it was considered necessary to maintain by this line communication with Vancouver and the western shores of the Dominion, but as they will be connected by rail and telegraph with the Atlantic in no very distant future, the value of the Pacific communication is much discounted.

This may be a convenient place in which to consider what are our available naval means of offence.

In the Naval Prize Essay of 1880, the author, after an exhaustive treatment of his subject, summarizes his views in five brief recommendations, and thereupon depicts an ideal naval battle. No one, I think, will say that the number of vessels in his Channel Fleet is one whit too large for the enemy he finally succeeds in vanquishing. In

fact, some critics may consider 25 to 20 long odds against his fleet the days in which Dibdin chanted are past, I venture to assert never to return—

“Come three to one, right sure am I,  
If we can't beat them still we'll try  
To make old England's colours fly.”

He allots 10 battle-ships to the Mediterranean fleet, and then has but 10 for all the Foreign Stations.

It appears from the Navy List that our actual fleet is at present stronger than his ideal fleet by 11 armoured ships, including the reserve ships,—and by 9 armoured ships which can be prepared for auxiliary service, but which are at present unappropriated,—and that there are 5 battle-ships of the most powerful description on the stocks.

Nevertheless, it would not be safe, even with our present strength, to allot more to Foreign Stations, because a respectable force must be retained for home defence;—and this seems to be the blot in the disposal of the Navy leading up to the ideal battle, that all the English eggs were in one basket, there was no reserve behind the fleet of 19 vessels, and I have always admired the nerve of that Admiral who “never having seen a shot fired,” pitted 19 ships weighted with the fortunes of England against 25 ships of equal power.

So that the Foreign Stations would have to do the best they could with 10 armoured ships and the 32 cruisers now told off to them,—for the 44 remaining cruisers would all be required in British waters.

I do not pretend to solve the question, but I ask naval members would you be content with—

1. A Channel fleet of 20 armoured ships.
  2. A home fleet of 7 coast reserve and armoured ships, 9 auxiliary armoured ships, 7 coast ships also armoured, and 31 cruisers.
  3. A Mediterranean fleet of 10 armoured ships.
  4. 10 armoured vessels and 48 cruisers for all Foreign Stations.
- Compare the numbers of the British Fleet in 1805.<sup>1</sup>
1. A Channel fleet of 29 liners, 35 frigates, and other vessels.
  2. A home force of 4 liners, 74 frigates, and other vessels, besides 18 liners in port, fitting.
  3. A Mediterranean fleet of 12 liners.
  4. { A fleet off Spain and Portugal of 14 liners.  
In America and West Indies, 8 liners.  
East Indies, 8 liners.

In addition to the home force, 10 frigates were in the Thames, 46 gunboats of sorts at the Nore, and a special flotilla for general coast service of 660 vessels.

The naval authorities of that day were thoroughly roused to provide for the defence of the realm, nevertheless the reduction of the military forces, and the neglect of the fleets and arsenals then as now formed a source of complaint, and Pitt in introducing his Defence Bill the previous year animadverted strongly upon it.

At that time France brought only 48 liners to the coalition with

<sup>1</sup> 1805. Sea service:—116 liners, 152 frigates, 120 sloops, 145 smaller vessels.



Spain and Holland, which added 29 and 15 liners respectively, in all 92 liners; so that we were superior by 22 liners, and, perhaps, 50 frigates and sloops, but we had no Cape Station, no China, and no Australian Stations, and we had 24,000 miles less of sea communication to maintain, and not more than one-seventh of our present commerce to protect.<sup>1</sup>

It will perhaps be said, and truly, that if our Navy, while gaining in strength, has diminished in numbers, so have the Navies of other great Powers, but the reply to this is that, looking to the nature of our Empire, we cannot afford diminution in the number of our vessels in anything like the proportions which more compact Nations may.

Some naval Officers, I understand, go so far as to assert that our Navy is less strong—not relatively, but actually—than the Navy of our opposite neighbour.

Now, such inquiry as I have been able to make does not establish this, but the power of an Ironclad depends upon a combination of so many qualities, the proportions of which vary so much in ships of the same class, as to render comparison most difficult.

These qualities are :—

1. Gun-power;
2. Armour;
3. Speed;
4. Manœuvring power;
5. Coal-carrying capacity.

The ironclad navies of England and France collated from the Navy Lists, with "The Statesman's Year Book," appear to be as follows :—

	No. of ships.	Tonnage.	Horse-power to tonnage.	Gun-power to tonnage.
England .....	44—10 building	342,100	1 to 1·43 tons	1 to 53·7 tons
France.....	36—12 „	262,021	1 „ 1·68 „	1 „ 57·5 „

England, 1st class, 5,000 tons and upwards, 26; 2nd class, 3,000 to 5,000 tons, 18=44.

France, 1st class, 5,000 tons and upwards, 21; 2nd class, 3,000 to 5,000 tons, 15=36.

In armour protection :—

	England has—	France has—
14 ins. to 24 ins.	58,280 tons in 6 ships.	7,239 tons in 1 ship.
10 do. to 14 do.	72,770 do. in 11 do.	57,041 do. in 9 do.
6 do. to 10 do.	77,860 do. in 12 do.	112,605 do. in 23 do.
	208,910 do. in 29 do.	176,885 do. in 33 do.

	£
<sup>1</sup> Exports .....	50,000,000 Ann. Register.
Imports, not stated but assumed ..	42,000,000

Total..... 92,000,000

2 1

So that, excepting Italy, which has 28,000 tons in 2 ships with 30 inches of armour, and 21,300 tons in 2 ships with 22 inches of armour, we seem to be in advance of other nations.

In unarmoured vessels we have 79 to 34 in the French Navy, and our fastest vessel of the "Iris" class, is faster than their fastest of the "Tourville" class.

In gunboats we compare favourably in numbers, which are in the proportion of 3 to 2, but we have 3,800 miles of coast to protect, whereas France has not half,—only 1,260 miles.

My enquiry leads me to the conclusion that we have a superiority over the French Navy, perhaps in the ratio of 6 to 5, and allowing for superiority,—and I think we have a clear superiority in nautical aptitude,—this may rise to 7 to 5,—but the question is, is this superiority sufficient? Looking to the nature and extent of the duties which our Navy has to perform, no unprejudiced person will, I think, admit that it is nearly sufficient; considerable addition should be made, but the nature and extent of that addition I leave to others who are more competent than I am, to decide.

I think it should not be less than one-half more.

It has been estimated that we should require at least double our Peace Establishment on an outbreak of serious war.<sup>1</sup>

In this question of addition, facilities for coaling occupy a prominent position; the ideal arrangement of coaling stations, is stations at such distances apart, as can be accomplished by cruisers, with something in hand, at full speed. Now it has been stated in this theatre that vessels of the "Alexandra" class can barely carry coal for four days' steaming at full speed, about equal to 1,200 miles, and it would be practically impossible to provide coaling stations at such close intervals; however, cruising ships of this class do well, I believe, under sail when the weather is favourable, and can cover great distances under steam at reduced speed, so that we shall not much err if we fix our ideal stations at about 2,000 miles apart; in practice, however, the distances between them will often be much greater, but what suffices for the requirements of the Navy proper, will be amply sufficient for Auxiliary merchant Cruisers, whose part will be running fighting with a view to impede the enemy, while convoys escape, and station cruisers come up to the rescue.<sup>2</sup>

Moreover it must be borne in mind that hostile cruisers will need coal as much as our own, and will probably be less well supplied,—that our boasted superiority goes for nothing if our cruisers, which are portions of a permanent naval organization, are not at least a point better in gun-power, armour protection, and speed, so that what we shall have most to apprehend will be a blow to our Territories delivered as soon as hostilities commence by a force carefully prepared beforehand, and assaults on our Commerce by fast vessels of the "Alabama" type.

The former may be left to the naval force on the station and

<sup>1</sup> Collinson, *vide* Journal, vol. xix, p. 81.

<sup>2</sup> Captain Colomb thinks these vessels should be able to go 3,500 miles without coaling.

to local means,—the latter to Auxiliary Cruisers;—and the question arises, How many of these shall we require? Some time back a naval Officer stated here that they should be placed twenty-four hours distance, say 200 miles apart upon all the great trade routes, or Commercial Highways; so that if they cruise in pairs, of equal speed, about 200 will be required.<sup>1</sup>

But I recollect also that in 1877 the chairman of a great steam line stated in this theatre that there were not eighty ocean steamers in this country suitable for this purpose.

This does not represent the whole, or anything like the whole, of the cost; merchant steamers can never be efficient as fighting cruisers unless special arrangements are made in their construction for the carriage of their armament, for the protection of their machinery, and for the provision of watertight compartments;—unless they are handy under sail, and capable of manœuvring with speed and facility.

These arrangements do more or less hamper them in their legitimate avocations, besides rendering their construction more costly, and owners cannot be expected to conform to them for nothing; indeed some owners, I believe, think that they should be subsidized for the purpose, others that a preference should be shown in the employment of their vessels by Government; the former appears to me the preferable course, it is less liable to abuse, Government knows the exact cost, and can at once decide whether to add to its fleet of Cruisers, or to subsidize more merchant steamers; moreover, by paying a retaining fee to the steam companies it has a lien on their vessels.

But having secured these Auxiliary Cruisers, the question, and I am not sure that it is not the more difficult question, still remains,—how are they to be manned? The guns will want gunners, and the ships will want seamen, or a portion of them,—of a higher class than the average seaman of the mercantile marine. In this marine it is stated, and as far as I know without challenge, that of the total number, 210,000, afloat, there are but 20,000 able British seamen; whence then are the additional seamen required to be obtained?

If the 20,000 able seamen are barely sufficient to leaven the whole mass of sailors afloat during peace time, what is to become of the mercantile marine when war is declared? The Navy will withdraw as many as it can of its 15,000 naval reserve men, probably 9,000, and will want all it can withdraw, it will want the 4,000 coast guard men, to man the ships now laid up in ordinary but then put in commission; it will want also the 1,750 Pensioners Reserve, and the 1,800 Royal Naval Artillery Volunteers for Home Defence purposes, this last force might with some consideration be considerably expanded, and I should like to see it expanded.

How is the waste estimated at 15 per cent. annually, about 5,000 men, to be met, and how is the waste in the mercantile marine estimated at 16,000 annually to be met? These questions I leave to naval men to answer, but they require serious consideration.

But having made the best arrangements possible for the provision

<sup>1</sup> If a war lasted six months, and no vessels were expended, the cost in hire alone would, I believe, be 1,540,000*l.*, irrespective of coal.

of an adequate supply of seamen for the Fleet, and this would, of course, include a proportionate increase of Marines, indeed looking to the duties they have to perform ashore as well as at sea, and the part they have filled in recent military operations, looking also to the fact that, as I am informed by Marine Officers, there is no difficulty in maintaining the present establishment,—how different from our Army which seems in a chronic state of deficiency,—they should be at once brought up to the strength at which they once stood;—in the present mastless condition of many of our ships, a portion of the work, which in former times would have been performed by seamen, may, so some naval authorities think, be done as well by marines. Let us now consider what are the local measures best adapted for the defence of the Australian Colonies. At the outset I may say that in Australia there is almost complete unanimity as to the necessity for provision being made for the protection of their Country against foreign aggression, but there is division respecting the nature and extent of the protection required, and there is therefore the risk of finding on the outbreak of war some of the Colonies well prepared, whilst others are not defended at all.

New South Wales has been most energetic, and is most advanced in defensive preparation. Port Jackson is defended by 12<sup>1</sup> substantial batteries, well placed and mounting 45 guns;<sup>2</sup> the steamship "Woolomic," for training purposes, with a naval brigade, assists in the defence of the harbour and naval arsenal, in which are docks capable of receiving the largest cruiser on the station, and there is a considerable military force, 319 permanent artillery, 300 volunteer militia artillery, 40 engineers, 100 torpedoists, 1,340 infantry.

In Victoria, defence works are under construction, and a considerable portion completed; they will be armed with heavy guns. The naval defences comprise 1 turret-ship, 1 frigate, 1 sloop, 2 gun-boats, and 3 torpedo-boats, and a naval reserve of 226 Officers and men, in addition to the permanent naval force of 120 Officers and men.

A military force of 125 permanent artillery,<sup>2</sup> volunteer militia, 125 cavalry, 1,016 artillery, 250 engineers, 18 torpedoists, 2,191 infantry.

In South Australia, 2 batteries have been completed, a first-class steam cruiser is under construction, and a proportion of submarine mines has been provided.

An efficient volunteer force, 1880 in number, has been organized.

In Queensland, the land and submarine defences are nearly complete, a paid volunteer force has been established, it numbers 1,345,<sup>3</sup> Two gun- and one torpedo-boat are being constructed, and will be available this year.

In Tasmania the defences are progressing, and a volunteer force, 850 in number, has been organized.

<sup>1</sup> 5 at South Head, 2 at Mid Head, 5 at George's Head, 2 at Bradley's Head, 1 on Line Point: total 12.

<sup>2</sup> And by batteries: 5 guns at Bare Island, Botany Bay; 7 guns at Flagstaff Hill, Newcastle.

<sup>3</sup> 275 Artillery, 70 Engineers and Submarine Miners, and 1,000 Infantry.

In New Zealand the defences of the principal harbours are in progress, a considerable volunteer force is organized, 7,367,<sup>1</sup> and torpedo-boats have been ordered.

It is to be observed, however, that there is no *Unity of action* between all these Governments, and the want of this may lead to unnecessary expenditure, and must lead to some inefficiency.

The first step towards *Unity of action* is agreement as to the nature of the attack to be apprehended. As already pointed out, we shall be unable to restrict the ships of hostile nations to their own waters, and we should, therefore, look to the attacks of flying squadrons in which one or two may be ironclads of not inferior class and power to those of our own squadron in Australian waters; for defence against such attacks each Colony and each Harbour must depend upon itself.

Some authorities do not apprehend attack of so serious a nature; but the greater contains the less, and we should provide against such.

The second step is *Unity of system and organization*, so that each Colony may be in a position to help the others in the event of war.

The third step is *Concert* with the Home Government, which would lead to one head for all the military forces, and this head should be an Imperial Officer of high position.

But Concert with the Home Government to be effective must be based upon a consistent policy and a clear understanding. Now this clear understanding I take to be that our Empire, no matter what seas intervene, is *one and indivisible*;—and this consistent policy I take to be that the defence of our Empire—*Imperial defence*—is as a whole, no matter by what enemies assailed.

But the question arises what should be the share of our Territories Abroad in the Defensive Measures we are advocating. We shall see, speaking generally, that they are willing and have undertaken their own local Defence. I wish it had been upon a more uniform system, and in concert with the Home Government. Should they bear their share in the Naval Expenditure? We think they should,—1st, because their interest in Imperial Defence is not limited to their own shores, their commerce which is bound up with that of England cannot be separated from it, and is already of very large proportions, and they might and would no doubt contribute liberally to Imperial Naval Expenditure, stipulating perhaps that a certain Naval Force should always be retained in local waters.

If we had always acted upon this understanding, some outlying portions of our Empire would be more prosperous than they are at present; if we had always borne this policy in mind, the defensive organization of our Empire would be now more harmonious, and considerable outlay would no doubt have been saved.

It is impossible to disregard the present tendencies of peoples to empire themselves in great nationalities, and the effect of this tendency on the smaller Powers,—they will drag on an existence on sufferance, and after a time will be absorbed by their greater neighbours.

<sup>1</sup> To be reduced to 4,000.

What will be the ultimate fate of Belgium and Holland,—of Denmark, part of it has already been absorbed, and of Portugal? Their existence as independent States is precarious, for it depends upon the forbearance of neighbours, who will forbear as long—and no longer—than suits their policy.

And when France, with a population 37,000,000,—at 183 per square mile; Germany, with a population 45,000,000,—at 213 per square mile; Russia, with a population 84,000,000,—at 40 per square mile; expand to the density per square mile of England, 445 per square mile,—in what position shall we be if we are limited to these Islands?

It seems to me that our existence as a first class Power, if not our independent existence, rests upon the consolidation of our Empire by cementing into federal union with us our Provinces beyond the seas; but certainly without such Federation we shall be dwarfed into insignificance beside the rising magnitude of Russia in Europe and Asia, and of the United States in America.

Professor Seeley says that the chief forces which hold a community together, and cause it to constitute one State,—are common nationality, common religion, and common interests,—and he points out that whereas some nations have lasted centuries without the first two forces, they at least are present in Greater Britain, and in union of the most vital kind; this may well encourage us to improve or to create the third force.

But, say some writers, there can be no community of interests between countries differing so much in climate and habits as Australia, Canada, the Cape, and England, and no organization can be devised to render the whole military force of the Empire available in time of war.

The bonds of feeling and interest did not prevent the bloody struggle between the Northern and Southern States of the American Union, and why should we expect that the weaker ties, which bind us to provinces so much more dissimilar in political feeling and government, should prove more enduring; and as a proof of how little is our ability to mould these provinces in the direction we desire, they instance our inability to impel emigration in their direction, for while 4,500,000 emigrants have gone to the United States, only 2,500,000 have gone to the whole of the British Provinces (last year 179,000 went to the United States, but only 43,000 to the Dominion of Canada).

This latter may be termed the pessimist,—and the former the optimist,—view of this question.

I prefer the optimist view, and in my humble way strive, and shall continue to strive, to give it effect, satisfied that such effort, even if it should unhappily result in failure, must be attended with some beneficial effect.

How, it may be asked, can human beings have a common interest in any concern in the regulation of which they have no share? The reply is, that to give them an interest you must admit them to a share.

Three methods of admission have been discussed, viz. :—1. By the



admission of Representatives to Parliament ; 2. By the Agents-General in England assembled as a consultative body ; 3. By a Council, somewhat on the lines of the India Council, formed perhaps from past Governors and Premiers.

But they should not be, indeed they would not consent to be, as the Indian Council, mere cyphers in the hands of a Secretary of State, who, under our political system, is often placed not for knowledge of the province which he administers, but in deference to the exigencies of party or to the claims of birth ; this system, which, in the case of India, will we hope,—as her affairs become better known and interest more widely the general community,—be rationally modified, would not suit the representatives of our Territories abroad, nor ought we to wish that it should.

Time would not avail me to discuss this, nor would it be expedient to do so on this occasion, even if I had the necessary information ; but it may be briefly stated, that the subjects which would occupy the attention of any such body would be peace and war, the extension of territory, international communication, and the regulation of commerce.

Nor need distance be any bar to the accomplishment of this ; steam and electricity have already done so much, and will do so much more in the future, that political union over these vast expanses of water is already closer and more certain than the union of 80,000,000 of Russians scattered over a territory of 2,000,000 of square miles.

I, then, will not allow myself to despond in this matter of federation, especially when I call to mind what the Dominion of Canada went through before it accomplished its federation.

The federal union of the British North American Provinces was first shadowed out in 1784, revived in 1800, 1814, and 1822,—pushed forward by Sir F. Head,—taken up by Lord Durham,—and finally accomplished in 1867, when Lord Carnarvon held the office of Colonial Secretary ; and this in spite of the conflicting interests of the eastern and western provinces.

Seventy years was this federation in accomplishing itself, and now the Dominion is blessed with an ample share of prosperity, rejoicing in the possession of actual independence, with a responsible Government under its own control, and in close and loyal alliance with Great Britain.

But were I less hopeful of the federal Union I wish for, I would still give it a trial. Our interests so bind us to maintain the connection of our outlying Provinces with each other and with us ; for in half a century, supposing our Empire to hold together, the Englishmen beyond the seas will be equal in number to the Englishmen at home, and the total will be more than a hundred millions.

The Dominion is a source of strength to the Empire ; it has an active militia of 40,000 and a reserve of 600,000 men, and in 1858 it raised a regiment for the British Army.

The active militia, which consists of volunteers, regular, and marine militia, is drilled annually for from 8 to 16 days. All males between 18 and 60 are enrolled, and divided into four classes : the single men

and widowers without children being enrolled in the first two classes, viz., from 18 to 30, and from 30 to 45 years; married, and widowers, with children, up to 45 years, in the third class; and all others in the fourth class.

Of late years it has been the fashion to disparage the West Indian possessions, yet they have a population of 1,250,000, an area of 12,750 square miles, and can by no means be left out of account. No doubt their position is far less affluent than in the days when slavery existed; then, with the cheapest labour, a favourable system of duties, aided by a delightful climate, they rose to the highest pitch of commercial prosperity, from which the fall was deep and rapid, but not irretrievable. Again, they appear to be emerging from the pecuniary misfortune which, under sharply altered conditions, overwhelmed so many of their most prosperous citizens, and will, we may hope, under a more congenial Colonial administration, secure to them the meed of prosperity which they deserve.

Materially, as well as commercially, they are of importance to us, and should be admitted, not pressed, to their share in the defences of the Empire. Jamaica, the most important on account of its Harbour and Naval Establishment, is well able to assume its share, both in men and means. Antigua, where in times past there was a Naval Establishment, should receive attention.

Something too might be done by State-directed emigration. Pensioners, naval and military, might be induced to settle in our Territories abroad, with a retainer for naval and military Reserve Defence within the limits of the Territory within which they settle.

I cannot pass from this part of my subject without devoting a brief consideration to India. Our relation to India is altogether different to our relations to Canada or to Australia. India has been gained by the sword and must be held by the sword. In India we must always be a dominant race; three centuries of occupation have shown that here, at least, we are unable to colonize, and, looking to our tenure, I cannot but regard the establishment of an enemy in force upon any part of the coast of India as fatal to our rule.

What is the tenure of our rule? An army of 64,000 Englishmen and of 132,000 natives, wielded by an administrative body of 60,000 English civilians dispersed over a vast country and amongst a seething mass of 197,000,000. The independent and semi-independent native princes who rule over 50,000,000, not included in the above, if they collected their standing armies under one leader, would array against us forces outnumbering ours in the proportion of three to two.

What is to be the future of India? That we are unable to conceive. We have seen that we are but 130,000 Englishmen sojourning sword in hand among 250,000,000 natives; we know that we are as alien to those millions as we were when we entered upon this military occupation 300 years ago. What progress have we made in all these years? Try our progress by the religious test. The Christian population numbers, all told, 1,800,000, and while we have been painfully collecting this small number to the Christian fold, the Mahometan religion, here an aggressive religion also, has increased to 50,000,000,

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—and this, too, while abandoning its primitive mode of propagation, —by the sword,—has gained 20,000,000 of adherents in China, has overrun Borneo, Sumatra, and the adjacent islands, and has spread to the west coast of Africa.

The burden of responsibility implied by our position in India may well fill the most sagacious statesman with apprehension; that position is to be retained only by the most firm, the most conciliatory, the most wise administration. If I am sometimes tempted to speculate upon the benefit we derive from the possession of India, I am speedily bewildered in a maze of perplexities; but this at least is clear to me, we dare not abandon India, we have held it too long, to do so would be a confession of weakness, and probably a political crime. The inhabitants are not ripe for self-government, and we cannot afford to let it fall into the hands of an enemy, its position is so potent for aggression.

In spite, too, of the difficulties of our tenure, there is much ground for hope in the future of India. An income in excess of expenditure, and raised without exciting discontent,—material improvement in the condition of the mass of the people,—the civilizing influences exerted by the equal administration of justice, by facilities for intercommunication, and by the extension of great public works,—should inspire the native races with confidence in our rule, if not with affection for their rulers; but it behoves us to look well to the quality of the instrument by which our rule is maintained; and one of the military questions which calls for the most careful consideration is the composition of the English Army in India. Should it be a local English force raised for service in India alone, or should it be detailed as now from the general strength of the Army? Upon these points the difference of opinion is great, but to me the balance seems to be in favour of the former; at any rate, the advocates of the former assert that men may be induced to enter for a local army who will not engage for ordinary military service,—great saving of expense in Transport,—that thus a wider field of enlistment and among a better class is laid open, and that by relieving the regular army of the constant drain which India now makes upon it, the number of recruits required for it annually is lessened, the waste in it is diminished, and the military and moral efficiency of it is augmented. It is advantageous to learn the ways and language of the country in which they are serving, and which by the present system they do not. The present system removes men so soon after they have become acclimatized, that the value of acclimatization is in part lost.

It may be convenient to recapitulate the defensive measures advocated; they are:—

1. Defences of London .....	5,000,000 <i>l</i> .	
2. Central Arsenal .....	1,000,000 <i>l</i> .	
3. Commercial Port Defences ....	2,000,000 <i>l</i> .	
4. Harbour Defence Vessels }	....	{ Provided in Annual Naval Estimates.
5. Gun and Torpedo Boats }	....	
6. Strategic Harbours of Refuge ..	2,000,000 <i>l</i> .	

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|---|--------------------------------|
| 7. 80,000 additional Militia .....                                | } 850,000 <i>l.</i> per annum. |
| 8. 20,000 Sea Militia .....                                       |                                |
| 9. Coaling Stations Defences.....                                 | 2,500,000 <i>l.</i>            |
| 10. Submarine Cable Communication                                 | 2,500,000 <i>l.</i>            |
| 11. 60,000 additional Regular Troops, provided in Army Estimates. |                                |

This is a large sum of money, but the interests at stake are enormous; moreover, the measures enumerated above are absolutely necessary for the defence of the Empire, and cannot be done for less. If the country enter upon this matter, it should enter upon it with the prudent, the truly economical resolve to do what is necessary, no matter what the cost may be; there can be no greater error than to enter upon it in a half-hearted way; money expended upon Defences which are insufficient, is money thrown away.

It is well to bear this in mind, because an attempt has been recently made to disparage the expenditure on Fortifications of previous years, with a view apparently of showing how much more may be done with a less expenditure now.

In a communication, in January last, to one of the leading papers, a writer, who is styled a military correspondent, makes three assertions respecting the Fortifications constructed under the Loan for the Defences, viz. :—

1. That 15,000,000*l.* were expended upon these Fortifications.
2. That the Fortifications need many modifications, because their designers had singularly little power of looking ahead.
3. That the future possibilities of artillery clearly indicated by the American War of 1866 were either put out of sight or forgotten.

In a letter of reply addressed to the same paper, our chairman showed that "1" was absolutely untrue; that the cost, including the expenditure on land, was 6,500,000*l.*, not one-half the above sum.

With regard to the second assertion, I will simply observe that at the time the Spithead Fortifications were designed, the most powerful gun in the Service was the 68-pr. of 95 cwt., whereas the gun now proposed for these forts is the 12" B.L. gun of 50 tons, throwing a projectile of 850 lb., with a muzzle energy of 26,000 foot-tons, powder charge 450 lbs., muzzle velocity 2,100 foot-seconds; in fact, the collective energy of the armament about to be placed in these forts will be more than double the collective energy of the armament for which the forts were originally designed.

In the American War of 1866, the most powerful American gun was the smooth-bore Rodman gun of 15 inches.

When a military writer puts himself forward to enlighten the Public on a military matter of national importance, it is presumed either that he has access to public documents, or that he possesses an intimate knowledge of the subject upon which he writes. Now if a writer, enjoying either or both these advantages, deliberately puts forward such mis-statements as those in the communication we have been considering;—What shall we say of him? In what terms can we appropriately designate his conduct? The Government of the day, whichever party is in power, should not be deterred by questions

of cost from this subject of Imperial Defence; its importance cannot be overrated, and after all what is the cost?

5,000,000*l.* for the Defence of London. Why the School Board of London has spent in School buildings alone that sum during the last twelve years.

2,000,000*l.* for the Defence of the Commercial Ports. Why it is a fleabite in comparison with the wealth in three of the ports, and is about one-fourth the value of the ships always in Liverpool alone.

1,500,000*l.* for Strategic Harbours, which will be most admirable harbours of refuge for our seamen and fishermen. Why it is little more than two-thirds of the property lost annually on the shores of the United Kingdom, and about one-fourth of the British property lost annually at sea.

2,500,000*l.* for the Defence of Coaling Stations abroad. It is nothing in the scale when weighed with the magnitude of the interests involved, and the security of the property at stake. It does not amount to one penny in the pound upon one year's commercial transactions.

Moreover, when our territories abroad are willing to bear their full share, shall we hold back and haggle over cost?

This is what Sir H. Parkes said at Glasgow on the 25th February last of New South Wales: "The Colony had built Railways, Docks, and Military Defences without costing a farthing to England. No English soldier was, or would be, in the Colony. If the Mother-Country involved them with other Nations, instead of the Colony being a burthen to the Mother-Country, it would defend herself and be able to render assistance to the Imperial Government."

The other Australasian Colonies are of the same mind,—so too is Canada,—so too are all the other Colonies; all actuated by the same spirit, all pressing for the realization of the measures necessary for Imperial Defence, and we at home are lukewarm, nay, are not even in the miserable condition of lukewarmness; we, the most interested, we hang back: why, it would be worth ten times the cost,—even upon the ground alone that it served to bind our Provinces beyond the seas more closely to us.

Nothing, in my opinion, is too much to pay for the retention and maintenance of the English Empire in its integrity, and perhaps the weak point in the Royal Commission on the Defence of Coaling Stations was that English Possessions abroad were not represented upon it.

This subject of Imperial Defence, which, in its individual aspects, under the arbitrary divisions assumed in these papers, of the "Capital," "at Home," and "Abroad," has so much interested us, becomes of such absorbing concern when considered as a whole, that I am at a loss for words in which to place it adequately before you.

Some love to portray the Empire under the familiar picture of a father and his children, in which the children as they arrive at maturity enter upon the possessions of their parent.

To me the Empire presents itself rather as the union of a parent

never sinking into senility with a vigorous offspring ever rising to the maturity of manhood.

In such an Union there can be no decay; in such an Union there is no room for despondence. Let us then by all means in our power strive to make that Union not only close, but everlasting.

Admiral Sir E. FANSHAW: In the admirable lecture we have just listened to, Sir Charles Nugent has laid very great stress, and most properly, upon the numerical force of the Navy required for the defence of the Empire. He has placed its present force in the proportion of six to five, or possibly seven to five, as compared with that of our nearest neighbour, which has the largest naval force on the Continent; and he also most rightly states that ours should not be less than one-half as much again as that force. He has, I think, most properly based his argument very much upon our latest experience in naval warfare, that is to say, the experience of the French war. The comparative numbers of ships which he mentioned are not quite the same as those which I have been led to adopt; but that is of very little importance, because so much depends upon whether the ships reckoned are actually sea-going, or whether ships are included that are only suited for harbour service. However, I am pretty sure we began the naval war in 1793 with a proportionate force with reference to the French of three to two. I think we had about 118 actual sea-going line of battle-ships and the French had about 76. At the commencement of that war we had two allies; and, to dismiss the subject of allies in a few words, I may say that before that war had run much more than one-eighth of its course, both of those allies had passed over to the other side. The Dutch, although Republicans, had been under very great irritation against the French owing to their persistent attempts to get possession of their country; and the Spaniards also were much irritated in consequence of the execution of the French King: they being ruled by Bourbons and being essentially a monarchical people. Therefore there was every reason to suppose that these allies would stand by us; yet in three years they were against us. But the proportion of three to two was not found sufficient; for as the war went on, and before we had reached its naval crisis, we had much more than double the number of line-of-battle ships as compared with the French. Anyone who refers to the Abstract of 1805, in "James's Naval History," will see that our Navy consisted of 83 actual sea-going line-of-battle ships in commission, against somewhere about 37 of the French; and yet, notwithstanding that, we could not put on the field of battle an equal number of line-of-battle ships as compared with the French and Spaniards at Trafalgar. I think it is necessary in this discussion that we should have these facts clearly before us; particularly because, whenever the strength of the Navy is now discussed, it is always upon the question of whether we have or have not one, two, or three, more ships than the French. Not only was it found necessary, in the last French war, that we should have a Navy more than double that of France, but every party in power from the Peace of 1815 until quite recently, when ironclads were introduced, maintained a force very much greater than that of the French. Although now and then the French, in the time of wooden line-of-battle ships, did steal a march upon us, the balance, or rather the preponderance, was immediately re-established; and with that exception I think it would be difficult to point out any time since the Peace in which we had not half as many again of line-of-battle ships as the French. I am not willing to trouble you further, but I wish to urge the absolute necessity of carrying out what has been suggested by the lecturer—that we should raise our Navy to at least the proportion of three to two as compared with the French, in order to secure the defence of the Empire in time of war. There is just one other remark I would ask your attention to, which is, that the French naval war, so far as it was a struggle for naval preponderance, came to an end at the battle of Trafalgar in 1805; and from that time forth to the end of the war we had the undisputed command of the seas. We were fighting for our existence; it was essentially a defensive war; but in carrying out that defensive war we had to land and maintain an army in the Peninsula for six years, during which time the army raised itself to the very highest degree of honour and reputation. Its base of operations



was necessarily always on the sea; and the ocean's road from Portsmouth to Lisbon was quite as secure for the Duke of Wellington's supplies and reinforcements as the high road from Woolwich to Portsmouth. That was because we had a preponderance of two to one in the Navy as against the French, and therefore we were able to secure and maintain the command of the seas.

Captain J. C. R. COLOMB: When it is remembered that this lecture not only raises the question of the defence of these islands, but really involves considerations connected with the whole world, and when it is remembered also that a Royal Commission sat for three and a-half years to consider this question and that it took three and a-half years to deliberate, and yet nothing has come of it, I think you will agree that it is very difficult to discuss it in ten minutes. I may say that I have had the advantage of reading this paper carefully, and as I went along I made notes as to the points I should wish thoroughly to discuss, and when I turned down the paper and looked at my points I found there were forty-five, not one of which could be dealt with adequately under ten minutes. Therefore I am driven to make some very general and, perhaps, rather hazy remarks. Of course I agree in a general sense with almost everything that the gallant and able lecturer has said. Still before I come to other thoughts which rush into my mind, I find in the lecture one or two points which I cannot silently pass over. I must confess I do not think he has spoken distinctly enough as to the absolute necessity of blockade as the first principle of sea defence,—this is a question which he passes over somewhat too lightly. Secondly, I altogether differ with him if by the use in two or three places of the word "convoys," he still maintains that the old plan of "convoys," in these days of universal commerce, is possible. Convoys, I consider, are dead and gone. You cannot now convoy commerce, because our foreign commerce, once confined to particular seasons and to two distant parts of the world only in communication with Europe, is now universal all over the world, and constant as regards time. In order to convoy commerce you have first to catch and collect it, and thus you have to make commercial arrangements adapt themselves to your naval arrangements. That, as a possible programme, is dead and gone. If our commerce is to be properly defended it must be on the opposite principle, namely, making our naval arrangements conform to the natural movements of our commerce. That difficulty was dealt with so fully by me in a lecture delivered here some years ago on "Naval Intelligence,"<sup>1</sup> that I am quite confident that calm consideration of my facts and figures will prove I am perfectly right. With regard to naval stations, I would point out that the limits of our naval stations were arbitrarily fixed at a time when the conditions of commerce on the ocean were entirely different. Our naval stations in war must be adapted to the direction and volume of our commerce, and being confined by arbitrary and artificial boundaries, they do not form a reliable basis by which to determine the strategic values of fixed positions nor the measures by which our commerce is to be protected.<sup>2</sup> There is one such position on which I think the lecturer has not dwelt with sufficient emphasis, and that is the Imperial position in the waters of British Columbia. I have dealt with that subject on other occasions so fully, and General Laurie<sup>3</sup> having discussed

<sup>1</sup> *Vide Journal*, vol. xxv, page 553, *et seq.*

<sup>2</sup> This matter seems to me to be of such importance that I wish to illustrate my meaning. For example, Sir C. Nugent says the "Falkland Islands being at the extreme end of the station they are not convenient as coaling places." But the limits of a naval station can be altered by a single stroke of an Admiralty pen, and were they so altered to-morrow as to make these islands the central point, the gallant Officer's argument here quoted would cease to have any force. I myself believe that the outbreak of war will produce alterations in our arrangement of naval stations, and that the Falkland Islands will then of necessity be about the centre of a "Cape Horn Station,"—an "Atlantic Equatorial Station" being substituted for the present south-east coast of America station. Hence it is I disagree with assumptions simply based upon the existing arrangement of naval stations, however well they may be adapted to the requirements of peace.—J. C. R. C.

<sup>3</sup> *Vide Journal*, vol. xxvii, page 357.

the question in a recent lecture here, I will not trouble you with my reasons save to say this: I doubt if Sir C. Nugent has sufficiently borne in mind that the completion of the Canadian Pacific Railway will probably be a greater cause of variation in the development of the routes, volume, and direction of the commerce of the Pacific than possibly even the Panama Canal,<sup>1</sup> especially with regard to Australia. A point in the waters of British Columbia is some 1,000 miles nearer Sydney than Panama; and, therefore, *vid* British Columbia will be the quickest possible route not only to the North Pacific, but also to Australia. When the Canadian Railway is completed it will be the shortest possible route also to China. The Falkland Islands I attach the greatest importance to, for this reason, Cape Horn is one of the three great passes of the world, and the Falklands position is the only bit of British territory commanding that district. To Sierra Leone I also attach more importance as a strategic position than I gather from what the gallant lecturer says he attributes to it. The effect of steam development is, I have observed, pulling the ordinary crossings of trade on the Equator in the Atlantic Ocean more to the eastward and nearer Sierra Leone. The lecturer allows but 2,500,000*l.* for protection of all coaling stations abroad. The Straits Settlements and the St. Lawrence, however, between them show an entrance and clearance of tonnage very nearly equal to the total entrance and clearance of tonnage at the Port of London: our commercial harbour interests are as great abroad almost as at home. I would also point out that the St. Lawrence is not properly defended. There is another point on which I am at variance with the gallant lecturer. He puts down the value of the Suez Canal to us at over 150 millions worth of British goods in the year. I wish first to say that I entirely appreciate the enormous difficulties in the way of anyone really getting at a fair approximation of the values of the ocean and water roads. It took me ten years before I could begin to understand them, and some three years ago I calculated the value of our goods passing through the Suez Canal annually at from 80 to 90 millions; round the Cape 50 millions; and round Cape Horn 33 millions—and in consequence of my pointing out here and in the "Times" that nobody knew really what the value of the Canal was, a Government inquiry took place; and I hold in my hand a Parliamentary paper issued last year which shows I was right—the actual value of British goods passing through the Suez Canal is between 80 and 90 millions a year. It is one of the crossings from one side of the world to the other, and there are only three. Therefore, the effect of giving undue value to one passage detracts unduly from the other two. The fact is that over the Equator on the Atlantic there is some 20 millions' worth more of British goods passing every year than passes through the Suez Canal. Now to come to the general question, and just to take in conclusion a bird's-eye view. We are an Empire disjointed, not politically organized, and our defensive forces are not under a uniform system or control. That is an immense danger. When you go into the country, or towns, or into Parliament and talk about money for defence purposes, people immediately groan to you about the taxation of the United Kingdom, and they say they are oppressed with taxes. Let me tell this meeting that taking the Empire as a whole the sea trade of the Empire is about 1,000 millions in the year. The united National Debts of the whole Empire amount to about 1,100 millions, and you observe, are only about equal to the gross value of one year's annual trade. The entrance and clearance of shipping from the ports of the whole Empire is about 120 million tons; the revenue of the whole Empire is as nearly as possible 190 millions a year; the revenue of the Colonies is rapidly increasing, that of the United Kingdom stands still, and if this question of Imperial defence is to be

<sup>1</sup> The Panama Canal will do little more than vary the direction of communication between the Atlantic and the Pacific, while the Canadian Pacific Railway by developing an enormous fertile territory will also create a huge new market. The tropical and sub-tropical products of China and Northern Australia, &c., will thus be drawn, in ever-increasing volume, towards the waters of British Columbia; not because the Canadian Railway is a short cut to the old markets of Europe, but because a new "centre of interchange" has been established between the Atlantic and Pacific Oceans.—J. C. R. C.

approached properly it must be by estimating the resources of the whole Empire, and not limiting the out-look to the resources of only one part of it. That raises a great political question, because it is the foundation of English politics that representation and taxation go together, and therefore you cannot touch that financial problem without raising that great question which is coming, and which England, if she is to survive as a Great Power, will have to face before long, the political organization of her Empire. Still, Sir, in conclusion, I would say this, that supposing you construct a work at Vancouver's Island, say a dock, or that you make defensive works in a Colony in Australia—supposing you have to sink in what I call the "plant" of Imperial defence so much money, it seems to be reasonable that that should be done by loan, and by a loan raised by the whole Empire. This very year Canada has devoted a quarter of a million out of her current expenditure for the dock of Vancouver. The colony of Victoria not very long ago raised a loan for 100,000% for defensive works, and now proposes, under Major Sargood's report, to raise a further loan of 500,000%. The colonists are incurring these charges for really Imperial purposes, and what does the mother country do? She tells these colonies engaged in these works, and raising loans for purposes that not merely concern the Colonies but the whole Empire, to go as private individuals into the market. What is the result? They have had to pay 4½ per cent. on the money that they have raised for the benefit of the Empire, when at the same time the mother country can raise money at 3 per cent. Now only conceive what a difference that makes—consider the difference when it comes to millions, such as we see estimated in Sir C. Nugent's table, and see what it makes in the matter of current expenditure of a Colony. And when you have gone over the expenditure of the Colonies, as I have, and see the loans they have raised, let there be no more ignorant talk about the Colonies not doing their duty: it is the mother country that is not doing her duty. Having about seven years ago very warmly attacked the different defensive organizations of the Australian Colonies, each pursuing their several little separate dodges—so to speak—of defence, I wish to say that having watched their progress carefully, although outwardly there is no central control, I can see perfectly well that the Australian Colonies are gradually coming together into a uniform system of defence. I think the country and this Institution is indebted to everyone, more especially to an Officer so highly distinguished, and who carries so much weight as the gallant lecturer—who helps to bring Englishmen face to face with this question—"Are you, or are you not, prepared to abandon the notion that England has all the brains and the Colonies are simply to follow blindly in her wake; or are you going in for complete organized co-operation between England and her Colonies in measures for defence which will insure peace and guarantee the undisturbed progress of civilization?"<sup>1</sup>

Mr. FRANCIS P. LABILLIÈRE: Those of us who spoke of Imperial Federation in the early days of its discussion, not much more than a dozen years ago, were told, "You are theorists and speculators, talking of that which will be of practical importance perhaps fifty years hence to our children or grandchildren." No doubt Imperial Federation will be of intense practical importance to them—for on it their national greatness will depend—but it is of practical importance to us at the present moment. We have heard to-day, from the gallant reader of this paper, a statement of clear facts. He has pointed out the paramount importance to this country of the communications with the regions from which she derives her food supplies. That question has also been dealt with by my friend Captain Colomb. Now, this is one of the most intensely practical subjects which can be considered by any assembly, and so is the question of coaling stations and harbours which we always hear of in connection with it. The naval and the military authorities clearly know what to do with regard to this question; but who is it

<sup>1</sup> Limits of time having prevented my touching upon the telegraph question, I wish to state here, in support of Sir C. Nugent's statement, that before the existing line was laid to the Cape, *via* the Red Sea, I ventured to address a letter to the Secretary of State for the Colonies, pointing out the urgent necessity for adopting the Atlantic route.—J. C. R. C.

that are wanting with regard to the carrying out of this policy, and these means of defence which we have had brought before us? It is not the military or naval authorities, but it is the politicians; and the reason why you cannot have a complete system of defence, both by land and by sea, carried out by our competent military and naval authorities, who could do it for us in a short time, is because our statesman are not ready to give us that organization of government which is essential for the purpose of establishing the defence of the Empire, and maintaining those depôts and coaling stations and fortifications which are required. You cannot deal with this question therefore without being driven up to what people, only a few years ago, called the mere theory of Imperial Federation. That this question of Imperial Federation is an intensely practical one has been most eloquently and forcibly placed before us in that able publication which has just appeared, "The Expansion of England," by Professor Seeley. The writer has shown that the practical question—it is no mere theory—before us within the next generation is this, organization of our Empire or disintegration of our Empire. There is no alternative between the two. And the disintegration of our Empire means nothing more than this, that this country must, within a generation or two, in comparison with such Empires as Russia and such a Republic as the United States, be like Holland amongst the Powers of Europe. You cannot expand the size of these little islands; and they are now peopled up to, if not beyond their capacity of bearing population, and therefore they must either go forward, they must incorporate with themselves these great colonial dominions, by means of federation, or they must be content to fall back within a century, or to be "dwarfed," as Professor Seeley calls it, into the position which Holland, which last century was a Power in Europe, now occupies. That is an intensely practical and serious consideration. Professor Seeley has shown us, and it is a mere matter of calculation, that by bringing about the federation of our Empire you would add to the population of this country, you would bring into conjunction and union with them ten millions of Englishmen beyond the seas, who are as capable of maintaining the defences of the Empire, as interested in all those great questions—the Suez Canal and other great questions you may mention—as the people of this country are. You would bring these people into union with you, to stand shoulder to shoulder, to maintain the strength of the Empire and the efficiency of its defences. Now, if we must come to the question of federation, we know what federation is. We have before us at the present moment, federation as the means of union, the very life and strength, of two of the greatest Powers in the world, the United States and the Empire of Germany. Prussia when she succeeded in 1870 in establishing a German Federation did not in the least degree place herself in an inferior position. In merging herself, if we can call it so, in the federation of Germany, Prussia has not placed herself, in any respect of prestige or otherwise, in an inferior position, neither would England by such a union with her Colonies. Therefore, Sir, we must come up to this question of federation; for all these grand schemes of defence, of naval and coaling stations, will fall to the ground and fail us in our hour of need, unless we can organize them in conjunction with our Colonies, by means of federation.

Vice-Admiral PHILLIMORE: I am anxious to add my testimony of thanks to the lecturer for his very able paper. I remember that when Lord Keppel, the First Lord of the Admiralty, prepared for the American War, he stated that there were above 100,000 seamen and marines afloat. At the end of the great war with France I think the men estimated for came to 140,000. Now if, you take all our Navy and our naval reserves of every kind you will see how very far short we are of anything like that number. Our wants are five times the amount; our means of meeting it are really trifling. The supineness, the indifference of the Government and the country to our real needs in case of war seems to me perfectly astounding. There is one remark with regard to the harbours. In olden times whenever ships-of-war were liable to have an action or a collision, or to want repairs, there were good old heaving-down pits. You cannot heave down the steamers, but where are the docks? Look at Gibraltar and Jamaica: the collisions which happen at Gibraltar every year are appalling; and near Jamaica the accidents are very considerable, but we have no docks there. I cannot help thanking Sir Charles Nugent very much indeed for

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the great service he has done not only to this Institution, but to both Services, by the clear way in which he has put our wants before us.

Lieutenant-Colonel E. R. DRURY (Queensland) : I must crave your indulgence if I venture to offer a few observations on the subject of Colonial Defences, not being myself a professional soldier. I think that Sir Charles Nugent in his paper has hit the blot in our system, the want of unity of action. The mother country gave Australia responsible government—a great boon. She afterwards withdrew her troops from the Australian Colonies, and I think that in doing so she rendered us good service, as we were taught to be self-reliant. The next step was to send an Officer of great experience to assist us in planning our defences—Sir William Jervois, who was accompanied by General, then Colonel, Scratchley. The Colonies adopted the recommendations of Sir William Jervois, and have worked for years on the lines laid down by him, but necessarily the whole scheme of defence is fragmentary. Each Colony is working on its own lines, and although naturally we are labouring for the common good, by strengthening each individual Colony, yet we have not before us any general comprehensive scheme of defence. Feeling this want of unity of purpose a short time ago, the Commandants of the different Colonies agreed that the best thing would be to obtain the services of an Imperial Officer of high standing to take general command. Nothing, however, has been done as yet to carry out the idea. It was proposed that a General Officer of high reputation should be employed by the different Colonies to act as their military adviser in time of peace, without interfering with local action or internal administration, and that this Officer should take supreme command in time of war. If I may be permitted to suggest what should be done now, it is that this country should urge on the Australian Government the adoption of that recommendation. The initiative should come from this side. I do not think that you are doing your duty to us,—if you will pardon me for speaking so plainly,—in merely giving us advice when we ask for it. You recognize the enormous importance of Australasia to this country, and you wish to keep it, and we wish also to continue to belong to you. Such being the case, the time has come when you should distinctly face the question of the probable effect of a war on the Colonies. There are only two countries that we are likely to have differences with, one is Russia. The Australian Colonies are pretty well prepared for Russia now. We know that she would attack us by means of her "volunteer fleet," that she would aim a blow at British commerce, and might make raiding attacks on our ports. For these we are prepared. But we have a neighbour who is very resolute and gives us great concern at this moment, and that is France. France holds a strong position a thousand miles from our coast, and she has there a penal settlement which we view with aversion. She has recently announced her intention of sending a large number of convicts of the worst class to New Caledonia, and although I do not for one moment attempt to deny her right to do what she pleases with her possessions, we are perfectly determined that those convicts shall not come into Australia. This may lead to very serious complications. It is not a question of the annexation of New Guinea or the New Hebrides which occupies more the statesmen and politicians of Australia, but it is a question that comes home to the heart of every man who has a wife and family. We will not allow these French convicts to come amongst us, and we shall do our very utmost, lawfully or otherwise, to exclude them. What we ask of you is to give us the benefit of your trained intelligence, of your knowledge. We want you to plan out beforehand what should be done in the event of war breaking out with Russia, and what should be done if war broke out with France. We should then have some definite lines to work upon, we should know what is expected of us. I do not say that you are to take into your confidence every colonist of Australia, but you could confide to the Governors that portion of the scheme of defence which it is necessary that we should know for our own safety. That I think is the main point I should like to bring before you, and I cannot too strongly urge that the initiative in preparing definitive plans of action should come from this side. I must venture to differ from my friend Sir Charles Nugent on one point, and to give my reason for so doing. He said King George's Sound should be fortified at the expense of the Imperial Government. Now I think that the expense should be borne by the Australian Colonies. Although we may not federate for

some time to come, we shall assuredly unite for defensive purposes, and this question of fortifying a most important strategical point is one which should fairly be dealt with by the Colonies themselves. When you gave us Australia,—I say “us” as a figure of speech, we hope and believe that we are merely Englishmen living beyond the confines of the United Kingdom,—we received a great and magnificent heritage which we hold in trust for the Anglo-Saxon race, and in giving us this vast territory you undoubtedly imposed on us duties which we are now endeavouring to fulfil. I do not think that there is any idea in the Colonies of Australia that this country should be called upon to spend money on our territorial defences, but we look to you to guard the seas and to protect the commerce in which your interest is far greater than our own. I think we are all greatly indebted to Sir Charles Nugent for so clearly bringing forward these most weighty matters. I should like to add a word about the Officer who has been entrusted with the supervision of the whole work of Australian defences, and who has carried it out under enormous difficulties. He has been in turn Royal Engineer, diplomatist, and politician. This distinguished Officer, who has seen hard service in other places, and who now for the first time in his life feels inclined to run away, is sitting on my left. General-Scratchley, to whom I am alluding, has undoubtedly earned the gratitude of all Australian colonists.

Tuesday, April 8, 1884.

GENERAL SIR J. LINTORN A. SIMMONS, G.C.B., R.E., in the Chair.

#### Adjourned Discussion on Sir Charles Nugent's Paper.

MR. FREDERICK YOUNG (Honorary Secretary of the Royal Colonial Institute): Sir Lintorn Simmons and gentlemen, a glance at the very comprehensive paper which was delivered in this theatre on Friday last by the gallant lecturer, cannot fail to strike everyone who has heard, or read it, with the impression that it contains some very suggestive points of vital interest to the future of the British Empire. In one of the opening paragraphs of this paper there is an allusion to the food question, which is of the greatest possible importance to us here at home. That leads to the consideration of the vital importance which it must be to the home portion of the population, that the food routes, *i.e.*, the ocean routes, should be kept entirely free and open. How this is best to be effected is a question which I will not, in the few moments at my disposal, attempt to discuss, agreeing as I do with Captain Colomb, who said the other day that it was impossible in so limited a time to discuss every point of so large a paper. Therefore I shall only take the liberty of alluding to one or two points that have especially struck me. The question as to the number of ships of the Navy necessary to protect those routes, and to the strategical points in different parts of the empire necessary to be protected, are too professional in their character for a civilian to discuss; I leave that part of the subject to those professional experts who are more competent to deal with it. But one thing I should like to insist upon, as one of the British public, *viz.*, that the ocean routes should be amply protected, never mind at what cost; and also, that the proper strategical points in the different parts of the Empire should be adequately protected. Whether it is desirable or not, as the gallant lecturer has suggested, that in case of war the Pacific station should be abandoned, leaving, as it would occur to an unprofessional man, as a result, the whole of our Australias unprotected; or whether St. George's Sound or other places are the best strategical points to be fortified, is not for me to point out; but there is no doubt that the whole paper teems with very suggestive reflections for those who have the interest of the Empire at heart. The question, after all, of the protection of these ocean routes, and the fortifications necessary to be provided

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in different parts of the Empire, is one of cost. If the Empire is to be "one and indivisible" (and I entirely agree with the gallant lecturer that it should be), it is necessary to ascertain how that cost is to be adequately provided and equitably distributed. We are face to face with a great national question, and we must deal with it in a broad and comprehensive manner. It is extremely refreshing to those who have taken up the question of federation to notice that it occupies so prominent a position in the gallant lecturer's paper. If the cost of defending the Empire is great, it must be paid by the Empire at large, and the expense cannot properly be met under any other system than that of federation. This is not the time nor the place to express my own views at any length on the question. Some few of us have already publicly announced our opinions as to the details we desire to see followed upon it. But of this I am convinced, that if the Empire is to be kept together in permanent unity, it cannot be done without a perfect system of federation. In considering a great question like this it is not necessary to appeal to patriotism—one of the noblest of national virtues—because it is not wholly appreciated by the people; nor to sentiment, although that, perhaps, has a very potent influence among mankind; but I think we may confidently appeal to self-interest, because that is a motive which is universal in the world. A permanent union of England and her Colonies can only be maintained by some form of federation founded on the principle of a United Representative Imperial Parliament. I will not further enter into this question; but I could not listen, as I did with the very greatest possible interest, to this paper, the other day, without saying a few words on this subject of federation, and wishing to give my tribute of thanks to the gallant lecturer for the candid and able manner in which he has expressed himself with regard to this question. I hail it as a very important departure that in such a place as this, among representative men belonging to both Services, and representative men from other classes also, we have had so frank an avowal on the part of Sir C. Nugent of his opinion of the only system by which this great national scheme, which many of those I see around me are so anxious to bring about, can be accomplished.

Captain WALKER, R.E.: Sir Lintorn Simmons and gentlemen, I wish to draw attention very briefly to one point which has struck me as being of importance with regard to the trade routes that have been so ably dealt with by Sir Charles Nugent, that is the development of the Canadian North West which is now imminent, and which will probably lead in the near future to our obtaining the greater part of the food supplies of this country from the provinces of Manitoba. Sir Charles Nugent pointed out a very short sea route from Churchill Harbour to Liverpool, and I should like to ask one question regarding that route merely for information. I have heard the question discussed very much in Canada as well as elsewhere, and it is asserted that that route is only open through Hudson's Straits for six weeks in the summer (though on this point I know there is considerable difference of opinion), and that for the rest of the year the Straits are so encumbered with ice that navigation is practically impossible. If that is the case, we must admit that this corn if it is to come to England must come by the existing route. Now what is the existing route? At present it is from Quebec by the St. Lawrence and the great lakes to the western extremity of Lake Superior, and thence by rail to Winnipeg. That route is utterly untenable in time of war, if we should have war with our only neighbour in that direction. The Ship Canal at Saut St. Marie, the entrance to Lake Superior, is on the American side, but even if that were not so, that route throughout its whole length runs along the frontier line of Canada and the United States, and is practically indefensible. The ship canals by which vessels ascending the St. Lawrence avoid the rapids are so close to the American shore that in time of war I do not think that they could be kept open. No doubt there is an alternative route, and it has been very much improved by the construction of a railway along the north shore of the St. Lawrence and Ottawa Rivers from Quebec to Ottawa, and thence by Lake Nipissing to Georgian Bay.<sup>1</sup> That will remove the

<sup>1</sup> The line from Ottawa to Georgian Bay is only in progress, not open. There is also an inland line from Ottawa to Toronto, *via* Perth and Peterborough, which must now be nearly completed, and which will be much safer than the Grand Trunk Railway, which runs close to the shore of Lake Ontario.

route from the frontier to a great extent, but it will leave the unfortunate gap at Saut St. Marie still in the hands of the Americans. Therefore I think we must admit that unless the Pacific Railway is constructed from Ottawa along the north shore of Lake Superior to Winnipeg this route cannot be defended. But this country to the north of Lake Superior is a singularly rough and barren country. I believe it is very rich in minerals, but it is very little known. I think it is then a matter of Imperial consequence that that portion of the railway should be made. But even when this is done, and when the route is complete, as it will be I believe in 1886, from Quebec to British Columbia, and we are in direct communication with our harbour (which ought to be an Imperial fortress) at Esquimalt, in Vancouver's Island, there is still one point in the line which ought to have attention drawn to it, and that is the point at Montreal. The whole communication depends on the security of Montreal, and I do not think anybody in this room could doubt for a moment if they saw a map of the Canadian frontier on the walls before them, that Montreal is the necessary objective point of any attack made by the United States (if such a thing should ever unfortunately occur) upon our Colony in Canada. Four lines of railway lead directly upon Montreal. 1. From Buffalo, which is one of the worst affected to the English of the large towns of the United States, because it contains a very large Irish population. 2. The main line from New York *via* Albany leads direct to Montreal. 3. The Central Vermont Railway to Montreal from Springfield. 4. The Grand Trunk from Portland to Montreal; and there is consequently no difficulty whatever for the Americans in placing an immense force in the field. The Americans have on the frontier at Rouse's Point a strongly fortified position within forty miles of Montreal. There is nothing in the shape of defence between that and the open town of Montreal. This being the state of things with reference to this Imperial communication, as we surely may call it (Captain Colomb very ably pointed out how it would be the trade route to the north Pacific, and thus of Imperial importance exclusive of its being also the means of bringing wheat from Manitoba), it is clear that if the line is to be kept open, the city of Montreal must be made a strong place. The fortifications of Quebec are already in a state of comparative completion, and only want arming, but they ought to be armed without any further delay. There is only one other point to which, with very considerable diffidence, I wish to draw attention, and that is the available force in Canada. Sir Charles Nugent, following the official figures, states the reserve militia to be 600,000 men. Now that figure is got by counting every male from the age of 18 to 60 exclusive of the 40,000 active militia. But with reference to that number I would merely ask, in case of a war within a very short period, how many of that 600,000 could be put into the field armed and organized by the Canadian Government? It is a very important question to ask, because, unless Montreal is fortified, the defence of it would require a very large and efficient field force.

Captain BEDFORD PIM, R.N.: I think the discussion up to this time has proceeded rather on the line of the confederation of the Empire. Now I am the last man in the world to say a word against the confederation of the Empire. I think the subject is a most serious one, and should receive the very closest attention on the part of the Government of this country; but I take it, the gallant lecturer's paper is based rather upon naval and military considerations. With regard to the very important subject he has brought forward, viz., the "Command of the Seas," in the presence of so many gallant Officers of the other branch of the Service, I am sure they will forgive me if I say that to my mind the whole matter rests with the Navy. It is a naval question pure and simple. Anyone who has had the honour of serving with the British Army must know what a gallant set of fellows they are in every way; but England, if she is to "command the sea," must depend on the Navy itself. I have the highest authority for the position I take, viz., the Preamble to the Naval Discipline Act, 29 & 30 Vict., cap. 119, in which it is said of the Navy, "Whereon, under the good Providence of God, the wealth, safety, and strength of the Nation chiefly depends." I merely quote this preamble to show that it is not mere egotism on my part, or the love of a bluejacket for his branch of the profession, but that it is really the fact when I say that the most important consideration for Englishmen is the state and condition of the Navy. I notice that the gallant Colonel has suggested that we should have in the Navy the services of "Auxiliary

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Cruisers," I think he calls them—merchant steamers. Really I hardly know how to tackle the subject. If the gallant Colonel would only go aloft on board one of those steamers and look down from the foretop on the length and beam of those ships, he would see that they are so extremely narrow and ticklish that it would be utterly impossible to run out merely one of the guns on board, especially in the event of their coal supply running out. I believe myself—and it can be easily proved any day by going down to the East India Docks and testing any one of these ships flying light—that if you were to run out one gun on the port side or the starboard side of these vessels they would capsize at once, and every rivet in the wake of the gun would be started upon firing one round. I do not think you could utilize these vessels for war purposes when the time arrives. I say it would be a very foolish thing indeed to do so; because the gallant Colonel himself says that the cost of those steamers for six months would be something like a million and a-half. Now, for 1,000,000*l.* you could build a hundred gun-boats which could sweep the seas; they would carry the longest range guns, be able to keep the sea under sail, and yet have engines capable of driving them at 15 knots on the day of distress when on a lee shore, and on the day of prosperity and joy—the day of battle. When I was in the House of Commons I had a draft of a gun-boat in the tea room a whole session, and I am prepared at once to show that nothing is more simple and more easy than to have these boats built in the way I have described. Now, how are you going to man these "Auxiliary Cruisers?" Sir Charles Nugent, at the end of his paper, has really grasped the question of the manning of the mercantile marine. He says that there are only 20,000 British seamen in the mercantile marine, and that is strictly true. I would even go so far as to say that of the 300,000 men employed in the mercantile marine there are not so many as 20,000 British seamen; the rest are made up of foreigners. I do not wish to speak offensively of anyone, but those men are the scum of the earth—they are gael birds. When I was member for Gravesend I have been on board ships without seeing one single solitary soul of an Englishman, the crew being made up of foreigners, and all as great scoundrels as ever stepped. These are facts which can be verified by anyone who chooses to take the trouble to do it. Would those foreigners help us in the day of adversity? We have never more than six weeks' food in this country, and never more than one week's food in London, and if our food supply were cut, what would it mean? If these auxiliary cruisers of Sir Charles Nugent's were to break down, as they inevitably would, what would be the result? Not only would there be an enemy before us, but revolution behind us. I have the great honour of being a magistrate of this country, and you may talk as much as you like about the proletariat of the French Revolution of 1789, but I have had before me, and seen in the lower stratum of this country, as big scoundrels as in any part of the world. With an enemy in front and these people behind, the position of this country is something appalling to think about. The paper of the gallant Colonel is simply admirable. He has done a service not only to this Institution, but to the whole country, and I most cordially thank him; for I suppose many gentlemen in this room know how for years and years I have striven to draw the attention of my country to the frightfully defenceless state in which we are in. We are not prepared, and yet nothing is more simple than to be prepared. We could, if we chose, have our mercantile marine manned with British seamen, and why should we throw our bread into the mouths of, and spend our money upon foreigners when there are plenty of youths willing to go to sea who are starving in our streets? I was anxious to say these few words on the subject because I think we cannot do too much to awaken our countrymen to the state in which the country is in. The other night we had a discussion in this theatre upon the food supply, therefore I will not repeat what I said on that occasion; but I should like to say this: that it is of essential importance to England that we should have a granary somewhere. The best place we can have for a granary is in Mesopotamia, on either side of the Euphrates Valley line. There you have grain which can be brought to this country by way of Cyprus, Malta, Gibraltar, without the expense of a convoy, which you must have if you bring it from any other part of the world. Colonel Nugent has alluded to the wheat question, and he gives the preference to India; but I may tell him that the corn from Bagdad and Bussorah ruled higher

in the market than even the very best Australian corn. It is not cleaned so well, but as a wheat, it is far superior to that grown in any other part of the world; and I was told by a corn factor on 'Change that there was nothing to compare with the Persian wheat if properly cleaned. I should like, as a last word, to say something more upon the question of gun-boats. Some people say that I have got gunboats on the brain, but, I do verily believe that for 1,000,000% you could have 100 gun-boats, which would be able to keep the sea under sail, and give us once more the command of the ocean, while we could also teach our young men to be as good sailors as their forefathers were. I do not want to hurt the feelings of any sailors present, but I defy any man to be a sailor who has been brought up in ironclads. I do not think he has got any of the old grit in him. But if you had these gun-boats cruising about under sail, all our young men would be sailors. It is nonsense to suppose you could carry on a great war at sea without having sailors. You do not want to have men of the penny steamers type—men of the "ease her," "stop her," and "go a-head" sort, but men who really know their profession. I beg to thank the gallant Colonel very heartily for his paper, which I think and hope will do immense good.

Lieutenant TUPPER, R.N.: Sir Lintorn Simmons, ladies and gentlemen, both Sir Charles Nugent and Captain Colomb have drawn attention to the necessity of blockading foreign ports in the event of war, but it seems to me it cannot possibly be carried on unless we have either sufficient ships to constantly relieve each other as they become short of coal, or else a system of coaling ships at sea. We have not ships enough to relieve one another, and therefore coaling ships at sea is a pressing necessity. For in blockading, ships will have to leave as they become short of coal, and thus create an opening in the cordon; and in the case of fleets when an enemy comes in sight, you may have only sufficient coal either to fight your action and then have no more to take you to your port; or enough to just reach your coaling port and no more, and so have to refuse action. Lieutenant Lowry, myself, and I hope others, have submitted plans for coaling ships at sea. They are, I believe, mathematically correct, but are not sufficiently good to justify experiment. I can only urge all Officers and engineers in the Navy and Merchant Navy to give their most serious attention to this matter, for it is a difficulty which must be overcome. I hope some Officers or body of Officers will soon succeed in devising a plan, and if they do, they will contribute immensely to the defensive and offensive powers of our fleets. Sir Charles Nugent has also alluded to our grain supply coming from America, and considers that we are provided with sufficient defences on that station. I beg to differ. On the North American station we have only one dock, at Bermuda, and at Halifax there is no dock; Cape Breton Island is undefended; Anticosti is undefended, and Newfoundland is undefended. If we were at war with France it seems to me they might take these and proceed up St. Lawrence to Canada. I know they have a longing for Canada, and they might easily pass our fleet in mouth of St. Lawrence in a fog and go without a check up to Quebec. In 1878 I could not help remarking the defenceless state of Quebec, and if the French did get to that city, I am sure the French Canadians would receive them with open arms. I do not know what the Irish would do. As regards the arming of cruisers in time of war, I presume that that will be dealt with fully in the Naval Prize Essay, but my opinion is that the Imperial Government might provide one or two cruisers fully equipped in all respects except in matter of a crew, and keep them at each of the principal colonial ports, and allow the Colonial Naval Volunteers to drill on board them at least once a week, supplemented by such English seamen as have nothing to do, and are waiting for their ships. An Officer might be detached and appointed to each Colony with a small staff to drill these men, and these cruisers should proceed out of harbour at least twice a quarter, manned by volunteers, and expend the quarterly ammunition. I am sure the volunteers would treat it as a picnic, and like it, and then when war broke out, you would at any rate have some men in the Colony who knew something about handling the guns aboard these ships; and if war were imminent, the Commander-in-Chief would be at the principal port, and might send a few men of the Royal Navy to these ships to form a nucleus, and fill up the crew with the volunteers, taking some volunteers also to fill up the vacancies caused in his ship.

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Admiral Boys; I will only make one or two remarks on some of the naval subjects dealt with in this paper, which I hope will be to the point. I refer first to the question of blockading which Lieutenant Tupper has touched upon, and about which there appears to be some difference of opinion, especially as to what will be done in the way of blockading in the future. This Institution is just the place where opinions should be ventilated and discussed, and then possibly we may get at something near what might actually occur and be useful for our future guidance. My view is that blockading depends on the question of what there is to blockade. If we have simply to blockade an enemy's coast, with the object of keeping her ships in port to stop her trade, I do not think it would be worth our while to employ an extensive blockading squadron for that purpose; but if it should be necessary to blockade our enemy's fleet, or prevent any expedition leaving a certain port, I think it would be our bounden duty to blockade with a fleet, which should not only be numerically, but also individually, superior to that of the enemy. Single ships no doubt will escape, but a fleet should never escape, and an expedition should never be allowed to leave a port. Therefore I think this country must be supplied with superior ships of every type to effect this blockade. In former days one line-of-battle ship was very much like another, and superiority was obtained by another fighting deck or a few additional guns on each deck, and this was readily seen; but in these days it is a very different thing. You see a ship inside a port, and you cannot make out whether she is powerful or not: there may be very little difference in appearance but great difference in power; hence the necessity of having the most powerful ships that can be built. I am afraid our undoubted superiority in seamanship has been to a great extent lost by the introduction of steam, and I do not think we can accept even the one point in the odds that Sir Charles Nugent has given us. He has made our superiority in consequence of seamanship as 7 to 5, instead of 6 to 5 without it. The view taken by my friend Captain Colomb (if he will allow me to call him so), is that convoying at the present day is not possible. I differ from him in that. We must convoy our slower merchant ships. The bulk of our Mercantile Marine is not made up of those large fast ocean liners that can take care of themselves, and when they come in sight of an enemy can make a run for it, can probably continue the chase till night, and then give him the slip. But a large majority of our merchant ships only go 9 or 10 knots, and I maintain they must be convoyed in their voyage either by one or two vessels continuing with them all through the whole voyage; or else by being met at various parts of the voyage and passed from one ship to another. With regard to the division of the world into naval stations, these appear to me to be simply administrative stations. They are not like the boundaries of a country, where you change jurisdictions, but simply for the sake of administration there is an imaginary line, the same authority commanding on either side of the line; and it appears to me a very unimportant matter where that division is, or what is the precise numerical disposition of ships on different stations. Sir Charles Nugent asks naval Officers if we are content with the numbers and distribution of the Navy as he has put it before us. There is but one answer. Although the description of ships he has given us is somewhat vague, I think it is perfectly clear that the force is not nearly sufficient. There is another point in comparing our ships with those of a neighbouring Power. The fact is, when fleets are supposed to be nearly equal in power, any such comparisons are most deceptive. How are they generally computed? A numerical value is given to various qualifications, such as gun power, armour protection, steam, and coal-carrying capacity. These are added up, the result is supposed to be the power of a certain ship, and an average of the whole is given as that of a navy. Take one instance only—"manœuvring power." Who is to state what the manœuvring power of a ship is? It is said by some that a short, light draught ship is an excellent manœuvring ship, but the contrary is the case. She may turn quickly, but she may steer very badly. The "Medina" class of gun-boat, as an example, is like a butcher's tray on the water. I have had some experience of our small turret ships, and they are most erratic in their movements; the stern does not follow the bow—they go along sideways. Thus when comparisons are made between fleets, they may be very fallacious; but between England and any other Power there should not be the possibility of any comparison whatever. With regard to merchant cruizers that Captain Pim was talking about, he says if a

gun is put into a long merchant ship, and run out on one side, she will capsize. I can only refer him to an existing fact, which is that the "Hecla," built for a White Star Liner, is simply at this moment a sample of an armed merchant ship, as well as a torpedo depôt; she does not capsize, but is an extremely useful vessel, and fights her guns very fairly. I do not suppose anybody would intend them to fight men-of-war, but to fight vessels of their own class, which they are quite capable of doing. Now what does Sir Charles Nugent's lecture come to after all? It comes to a question of money; and I think it is the most extraordinary condition of things that ever existed, that this country, the richest in the world, should be less capable of defending herself by her fleet now than she was in 1805! Our merchant fleet has increased ten-fold, but has our Royal Navy increased proportionately? Certainly not. I happened to be reading Secretary Pepys's Diary a little while ago, and I noticed a remark he made, that "We want money for the Navy; we must go to the Treasury to get money for the Navy; if we do not, the Navy will go to the dogs." He did not get the money, and the Navy did go to the dogs. In 1665, I think it was, the Dutch fleet commanded the Channel, came up the Thames, and burnt our own ships in front of Chatham. Chatham was not then so near London as it is now, but such a thing is not impossible at the present day, and the consequences would be far more serious now than they were then; and I maintain the motto of my old ship, the "Excellent," is still the motto of England, "*Si vis pacem, para bellum*,"—If you wish for peace, be prepared for war.

General COLLINSON: I am going to confine myself to two reasons why I think it is important both for the old country and for the Colonies to hold together. The first reason (and both of these reasons have been mentioned by the lecturer) is the immense importance to this country of providing a food supply for its population in time of war. I am very glad to hear from what passed in the course of this lecture, that this question is exciting more attention than it has done. I think it has not received the attention it deserves. It is an extremely important question to this country. I do not suppose there ever was in the history of the world another example of an independent country which depended on foreign sources for half its food supply. The free traders tell you that it is better on the whole, and safer, to depend upon all the world for your food supply, because you cannot war with all the world at once. But the truth is that the great bulk of our food supplies comes from two or three countries, and it is quite possible that these countries might be hostile to us, and might be in league together. And even again I do not think we take into sufficient account the immense political effect in war time of the trade in food. The trade in food is a one-sided trade. The United States people, for instance, could go on a long time without our shirts and knives and forks, but we cannot go very long without their food supply; and we must expect that when difficulties arise for this country, those countries which supply us with the greatest part of our food supply will use it as a very powerful lever to gain any purposes they may require against this country; and even if the food supply is not very seriously blocked, there can be little doubt that the prices would be raised to such an extent that there would be such a feeling amongst the people of this country, and such a pressure put upon the Government, that it would be almost impossible to prevent them from making what may be very disastrous concessions. Now there is one way suggested of improving this dangerous condition of things, which I think deserves very serious attention, because it seems to be one of the most practical ways of dealing with the question; and that is the putting of differential duties upon our imports in favour of our Colonies. This is not certainly a very favourable time for proposing such an idea in this country, but still I think the question will have to be raised. Therefore I think it is important that this Institution should record its opinion that it is very necessary to do something towards ensuring the food supply of this country in war time. The other reason why I think it is important to keep up the connection with our Colonies, is for the sake of the Colonies themselves. I do not think that there is any one of our Colonies sufficiently powerful, or likely to be sufficiently powerful for many generations to come, to remain independent or even neutral in time of war. We have seen during the last century what immense contests went on by sea and by land upon colonial questions, colonial interests, and colonial trade; and in the face



of the large Empires that are growing up, as we may say, all over the world, and increasing both their military and naval power, I think we must expect in the next general war that there will be equally great contests for those same interests. I do not for a moment doubt which side the Colonies will take, but I think, considering the extent of the wars that are likely to take place, and the immense demands which we shall make upon the Colonies for their assistance, it will be very desirable to add to that loyalty which they may already possess, a material interest in the shape of a trade in the food supplies that they would be able to give to us. This is not the place, Sir, for discussing the question of federation, but perhaps it would be legitimate for us to go so far as to express a practical opinion upon this point, that it will be a step towards a closer union with the Colonies, if there could be established in London a permanent Imperial Council for the defence of the Empire, based perhaps somewhat upon the same status as the India Council, and in which every Colony would be represented by its Agent General.

Admiral RYDER: I will confine myself to four points. (1) Harbour Defences against Naval Attacks; (2) Coal Depôts on Foreign Stations; (3) the missing Coal Links in North China; (4) our Naval Reserves of Men and Officers quite insufficient for a prolonged Naval War. (1) At the end of the *North and South War*, Admiral Porter was called upon to make a report on what the Americans had learnt during the war. The report fell into my hands, and it is a very interesting document. In part of it he treated of what were the proper defences of harbours, and he criticized from his own point of view—the sailor's point of view—the then ordinary practice of building large forts at low levels containing numerous guns, and he said that that system had been found to be an utter failure. Quoting the attack on Fortress Monroe, he said the proper way, from his point of view, and from his experience in the war, was to scatter the guns at high levels when it is attempted to defend a harbour against ships, and then the same work would be done with fewer guns, and better protection be given, viz., by placing them at a good height as was done with the "Wasp" battery at Sebastopol. In one portion of the lecture Sir Charles Nugent spoke at some length upon the defence of the *home ports*, and no doubt one of the arguments against our doing anything is the expense of having to build large forts. But it is not necessary to build large forts. As a general rule it is a mistake to build large forts; and it is a question well worth considering whether three, or four, or five guns should not be scattered about (provided the elevation and contour of the land be suitable), which could be made the greatest nuisance in the world to any attacking fleet, and whether that would not be the proper and the least expensive way of defending our colonial harbours and our smaller home ports. (2) Another point is the following phrase in the gallant lecturer's paper at page 472. Speaking of the remarks made by General Collinson, he says: "He (General Collinson) urged, I think, that we should seek a position nearer Japan, but I am not disposed to advance 1,200 miles in that direction, at least for the present, and now that so much has been done at Hong Kong we should rest contented with it. We might, however, attain our end with an alliance with Japan, and this is worthy of consideration, as Japan is not only highly civilized, but densely populated." I have had some experience of that station, having been three years there as Commander-in-Chief, and in the case of war breaking out we should depend upon a broken reed if we relied upon the friendship of Japan, a nation overshadowed by Russia, and one that, quoting Vattel on International Law, would as a *Neutral* power refuse us a single pound of coal if we were at war with Russia, and act quite rightly in so doing. Unless we took possession of some one of their islands, we should be utterly adrift in the matter of supplies of coal, Australia, some thousands of miles off, being our nearest available source of legitimate supply in time of war. There is, I believe, only one other point on which I am at issue with the lecturer, viz., that we have stopped short instead of completing the links of our great chain of coal depôts, which runs, with two long blanks, pretty well round the world. We have got, I think, eight stations between England and China. When we get to Hong Kong we unfortunately stop. The supply of coal at Labuan has never been put on a proper footing. Now this is at the lower end of the north-east monsoon, against which it is difficult, sometimes impossible, to force up any of our vessels of war larger than the gun-boat class, which creep up in shore. We have a

common saying that a chain is no stronger than its weakest link, but if its last links are wanting it is worse than having a weak link in it, and our last links have been omitted in our chain of coal depôts round that half of the world, our Government has in this respect been blind, hopelessly blind, for the last thirty years. (3) I think the lecturer speaks in one or two places of the length of these *coal links*, if I may call them so, and is rather inclined to consider that they might be lengthened out to 2,400 miles. Now my experience with English men-of-war leads me to think that you would be very unwise to depend upon anything like 2,400 miles. Just imagine the case where it is necessary to send ironclads as fast as possible half way round the world. Why 1,500 miles at twelve knots would run out the bunkers and break down the stoking of nearly all our men-of-war except of the latest type. I do not believe myself that anything longer than 1,000 to 1,500 miles for our coal links would be wise if we can secure them. We should aim at that as a maximum if we wish to be on the safe side. (4) We shall shortly have in our hands the Prize Essay on "Reserves of Seamen," that won our Gold Medal a few weeks since. It touches upon many points raised by Sir C. Nugent; among others the seamen available for *home* defence, and generally on the Reserves of Seamen for the Navy. You will find that the Gold Medal paper raises several most important questions. I believe myself, and my opinion is shared by many brother Officers, that our reserves of *drilled* seamen (*undrilled* seamen now-a-days are of very little use) are as regards numbers most insufficient, and as compared with those of France dangerously small. We may talk openly now about our neighbours. Of course we may go on saying, if we are so idiotic, that one Englishman is equal to three Frenchmen, but setting this obsolete view aside the French reserves of *drilled* seamen are far larger than our own. Look at the capital system established by Colbert, Minister of Marine in the reign of Louis Quatorze, and religiously preserved through all their troubles, by aid of which the French Navy was able in the Franco-German War to supply a magnificent *corps d'armés* of 30,000 seamen who were landed to help to defend Paris, while there were 40,000 seamen afloat (and remember that while we have 40 to 50 per cent. of our men-of-war crews non-combatant, the French have only 5 per cent.). Now we could no more do that than fly; it would be simply impossible to send a single seaman to help to defend London or any town or colony, and keep up the Navy afloat efficiently at the same time. When in command on the China Station I had an opportunity of studying the French system. As an illustration, when dining with the French Admiral at Hong Kong, a seaman from a small French merchant brig came aboard and reported that he was twenty years old, and had come to drill for his five years! he was afraid to go back to France without having presented himself for drill. "What will you do with that man?" I asked, "Oh," was the reply, "we shall keep him for from three to five years." Every merchant seaman and fisherman in France is bound to give himself up for five years' service from 20 to 25, and the French Government have thus got an enormous supply of *well-drilled* seamen. There is also a reserve of about 5,000 well-drilled officers in the French Merchant Service. We have not got 500 in ours. They keep them for three to five years in men of war, and then send them back to the Merchant Service as a thoroughly well-drilled body of seamen. Every year 7,000 seamen are in this way temporarily absorbed into the French Navy for drill. We have a valuable class of men in the Royal Naval Reserve, the cream of the Merchant Service, and the Second Class Reserve, and the Artillery Volunteers will be useful, but the Royal Naval Reserve men are very few also, and therefore our power of continuing a naval war will be certain to be lamentably insufficient unless we take some prompt steps to largely increase the number of men on *active* service and our reserves. This false economy is apparently the unavoidable results of the working of our otherwise glorious Constitution, which can only, it is said, be worked by "political parties," and these *must bid for popularity*, and nothing is so popular as a low Naval and Military Estimate. Now all this is thoroughly well known at head-quarters, and to none is it known so well as to the military and naval authorities, who are not to blame, but partly necessities. Political expediency in both the great political camps is responsible for a false and unpatriotic economy which results in this state of unpreparedness for war in which England and her Colonies have, so the Chairman, Sir Lintorn Simmons, emphatically informs us, been left.

MR. H. CHAYTOR: I think during this debate the gentlemen who have addressed this meeting are chiefly, or altogether, military and naval men, and under those circumstances I should certainly stand at a great disadvantage if it was not that the naval and military men want to come to civilians for the money they require. That of course is a point that has had my very great attention, and I shall say just a word upon it in a moment. I will, however, first speak of the refuge harbours that our gallant lecturer has alluded to; and it does seem to me a very curious policy, when you have so many harbours of refuge on the south coast, and not one for 560 miles on the east coast, that they do not begin on the east coast first. I must say it is most extraordinary, because we have a large mercantile marine serving on that coast; and not only that, but every harbour of refuge when you get to Yorkshire, northward, would be a coaling station; whereas at Dover you cannot get coal unless you carry it some hundreds of miles, at great inconvenience and expense, by railway. Therefore I must say, whilst fully recognizing the importance of Dover, that it seems a very curious policy to begin with that place first. Then as to the home defences, they, as shadowed forth by the gallant Colonel, seem to me as very perfect indeed. It is clear that they would be very expensive. Take for instance London. I think if it is to have forts they cannot be less than ten miles from the centre; that would mean a circuit of 50 or 60 miles, and you must have an enormous army to man those defences. Now unless we can hold our own by the fighting qualities of our men, I fear that these forts will be only of secondary use to us. At Metz the French were hemmed in and defeated in spite of the forts. At Paris they did hold their own for a time, but ultimately they had to succumb, and why? Because they were of inferior fighting power to the Prussian Army. It may not be known to all of you that the Italians at this moment are making fortifications to defend Rome; they are generally about 4 or 5 miles from the city, and consist of forts. That is perhaps a justification for the gallant lecturer advocating these defences, because there is another nation adopting them; that certainly is a point in their favour; but when he comes to the cost of these things he says, "One penny in the pound on our commerce will raise the necessary funds." I do not know whether he means the profits on that commerce, or whether he means the gross commerce itself; but certainly the penny will have to come out of the profits, and the profits are already engaged for a great number of pennies; and moreover the larger our commerce is, the less number of available pennies in the end come out free. The more business you do the less profit you make of it in proportion; every commercial man of business knows that to be the case. The subjects of the two lectures are very closely identified, but it appears to me from the considerations that have been brought before us, that we should make arrangements for colonial confederation. I do not know whether you are aware of it, but there is a society in London called the Fair Trade League, the very basis of whose policy is colonial federation. Our lecturer has stated that we are to regard the cost of fortifications, and for defending the transit of our food supplies by sea, as a premium of insurance paid for our safety; and if we are to pay insurance for these, surely it behoves us to pay a little insurance for what food we can produce at home. The gallant lecturer has said that a million acres have gone out of wheat cultivation in this country; that means a loss of 750,000 tons of food. And what is produced in lieu of it? If it is produced, as the non-agricultural mind says, in cattle, 25,000 tons of meat is almost all that same land will produce. It suits the aspirations of commerce, it suits merchants, it suits all those men that deal in trade, who are buyers and sellers merely, who have this large trade upon the sea; it suits the Board of Trade to point to enormous figures and to say that those figures show the prosperity of the country; but those figures are attained by one section of the country, the commercial element, at the expense of the agricultural element. You gain 10 per cent. or 20 per cent. on the cost of that wheat, but you will actually lose the whole crop it displaces, because I tell you the inferior lands mostly go out of cultivation, and that they will grow a mere nothing in substitution I know from practical experience. When land comes to 5s. an acre the produce cannot be very much. For the sake of obtaining these large figures, they will save 10 or 15 per cent. on the wheat bought, and they will lose nearly 100 per cent. on crops effaced at home. This is a very important thing, because if you just take it that it is

750,000 tons of wheat grown, you will have less to defend in coming across the sea, you will have that much more at home, and you will have all your difficulties and disadvantages lessened by that amount. Perhaps, as General Collinson has said, this is not the occasion to enter on a Free Trade discussion, but still you see the Free Trade element has knocked all this wheat out of cultivation. It has deprived you of all this vast amount of food, and tends to enrich one section of the country at the expense of the other. I should be very glad if Colonel Nugent would devote his attention to this question of Free Trade, and thoroughly ventilate it, for I am sure he will find that it is most arrant nonsense. I do not say that Free Trade is bad when carried to a certain length. Extremes are always bad, and when these things are carried to the extreme, that is where they fail. It is good if it is carried to a proper limit. Free Trade also, by reducing the hands required for tillage, sends population to the towns and mines, and so tends to reduce our best area for army recruits.

The CHAIRMAN: I think that we must "limit" our discussion.

Mr. CHAYTOR: I will just say one word about the Channel Tunnel. We do not find France, Italy, or Switzerland afraid of tunnels, only the British nation. I consider the Channel Tunnel a mere rat hole, and if a General could bring an army through the Channel Tunnel, he would be the biggest and the most competent General the world ever saw. When I was travelling in France last year, I had it on very good authority that it was contemplated by the French Government to place a corporal's guard at their end of the tunnel, and connect it by wires with all their military depôts; that would be sufficient. You can take up a rail, or stop the whole of the tunnel by many trifling means, and why we should be so terribly afraid of it I must say surpasses my understanding.

Colonel CROSSMAN, R.E.: I shall only make a few remarks upon one part of the subject which has been so ably treated by Sir Charles Nugent, and that is the coaling stations abroad, a part of the subject to which my attention has been devoted somewhat of late years. I see Sir Charles Nugent heads his second paper with a very important remark of Professor Seeley's; I should like to go a little further than that, and to say that in these days it would be well if no statesman were made a Minister of Great Britain before he had seen some part at least of Greater Britain, for no one can appreciate this Empire and know its necessities without having gone round the world. It is painful to see sometimes the crass ignorance displayed about the Colonies by people who ought to know a great deal better. This ignorance is certainly not so great as it was a few years ago, and for that I think we are indebted greatly to the Colonial Institute, of which my friend Mr. Frederick Young is the energetic Secretary. These colonial stations are, as has been aptly expressed by Admiral Ryder, coaling links over the whole world. Captain Colomb said the other day, and I am sure I speak with great respect of that officer, for no one certainly has written and spoken more on this most important subject during the last ten, if not more years, than he has done, in referring to the arbitrary divisions as it were of the present naval stations over the world, which by the way were referred to by Admiral Boys as merely marks for administrative purposes, he said he could not take those divisions as any basis in considering the question of our colonial defences, and I suppose he meant by that, as a basis more in considering the action of fleets than the choice of coaling stations, because there are certain points which are well known to us all, and which present themselves at once as those best suited for coaling stations and naval depôts in various parts of the world. If we take the Mediterranean, we first find Gibraltar and Malta, which perhaps ought to be looked upon more as fortresses in connection with the balance of power in Europe or of our European States than anything else, although they are still on the high road to India. Egypt and the Suez Canal is a very weak point in that line of communication, for there is no doubt that the Canal could be easily destroyed, and then we should have to revert to our former communications round the Cape of Good Hope; and I have always been impressed with the opinion that Simon's Bay is one of the places the defences of which ought to be taken in hand at the first opportunity. It is strictly an Imperial question, that question of our communication with India. Aden we have fortified, and are fortifying still; that is a point which should be made secure. Further eastward, Ceylon and Singapore are important coaling stations. As

regards the best port in Ceylon to be chosen, I have no present knowledge. Some say Trincomalee, some Colombo; for my own part I think the naval station ought to be, if possible, where the great commerce centres, and in this point of view Colombo seems the preferable point. Singapore is a very important place, as it commands the Straits of Malacca, and forms a stronghold in the south of the China Seas, where further north we come to Hong Kong. Hong Kong is, considering the nature and the importance of our trade with China; considering also the contiguity of two formidable Powers in that part of the world, perhaps one of the most important positions we have got. It is a pity that the requirements of trade at the time we took possession of Hong Kong induced us to make our only port there. I think in addition we ought to have had Chefoo or Chusan. Taking then a long stretch across the Pacific, we reach a place we have long neglected, and that is Esquimalt. I do not like the position of the dockyard in Esquimalt, it is too close to the mouth of the port, and I think it is a point for serious consideration whether we ought not to give up that place altogether as a naval station, and go up to Moody's Inlet, where the terminus of the Canadian Railway is to be, a place capable of defence, much more secure and closer I think to the coal fields of Nanaimo. Then we come to the Australian Colonies, and nothing I may say has more impressed me in all my visits to the Colonies than the able way in which the Australians have met this question of defence. In this they show an example to their mother country. The way in which their batteries have been designed and carried out, and armed, I think reflects great credit upon them; and they are also beginning to have, though perhaps not to such an extent as they might have, the men drilled to fight them when required. I think we can safely leave it to them to look out for their own defence. In the Pacific we have got no Naval stations at present. In Fiji there is one place which could be easily made a station, but whether it is necessary or not I would rather leave naval men to say. In the Atlantic we have Bermuda strong, Halifax moderately fortified. Certainly we want another dock, referred to by Lieutenant Tupper, but it would hardly be possible to expect that the great number of places mentioned by that Officer should ever be put into a state of defence unless it was done by the Canadians themselves at some future time. Nor do I think anything of a French invasion of Canada. They would certainly have us to look to; but there is such a thing as the Monroe doctrine, and I think that would bring the Americans against them too; so that I think the only danger we have to fear for Canada is a war with the United States, which I am sure we all sincerely trust will never occur. The Falkland Islands were alluded to by Captain Colomb; those I have not seen. There is a port there, Stanley Port, I believe, which can be easily defended, and I have no doubt, considering the great length of the Pacific Coast from Esquimalt downwards, that it would be advisable to have there some station if possible. In the West Indies, reference was made to the harbour of Antigua by Sir Charles Nugent; but that is small, and hardly one which would be made use of now. We have already a naval establishment at Port Royal, and I think Jamaica, from its position in connection with the Panama Canal, is the station which we ought to adopt in those seas. I have not time now to enter into any remarks as regards the first portion of Sir Charles Nugent's paper, but taking the sum of 14,600,000*l.*, which he mentions as required to complete our defences, as far as I calculate, that might be provided by loan and paid off in 25 years by the addition for that period of one halfpenny in the pound to the income tax. I think the feeling of the country is that such a sum is necessary, and I believe it only requires a strong Government to go to the House of Commons, and state distinctly what they want, and they would have very little difficulty in getting the money.

Colonel A. MONCRIEFF: I should have been inclined to offer some remarks on the subject on which Admiral Ryder has spoken, namely, the method of defending harbours, but I refrain from doing so at present, as on the 25th of this month I shall have an opportunity in this theatre of going into that subject, which is an important detail of the great question brought before us in the lecture. With regard to Sir Charles Nugent's very interesting suggestion about a northern route from Hudson's Bay to England, I may perhaps offer a few remarks, having spent a winter in Hudson's Bay Territory many years ago. One gentleman who spoke seems to suppose that this route would be only open for six weeks. I know very

well that great obstructions are met with in winter, but I scarcely think the place would be shut for the whole year with the exception of six weeks. When I was at Fort Garry in 1857, I saw several *bateaux* arrive from Hudson's Bay with troops to garrison the fort. They had come up from the sea at Hudson's Bay, and I have no doubt that at a moderate expense the falls near the mouth of the Saskatchewan might be locked, and the rapids between Winnipeg and Hudson's Bay might also be locked, so that the grain grown in that magnificent territory on the two forks of the Saskatchewan, said to be navigable for a thousand miles—a territory large enough to grow food for the whole of England—might be shipped in boats, and without breaking bulk sent down and stored on the coast in a position (in the latitude of Scotland) in Hudson's Bay, and re-shipped to England when the sea route was open. I do not say that it is feasible, but think it is a suggestion worthy of careful consideration, because it would open a direct route into the middle of the Dominion, and if it could be properly worked, would be valuable both on account of its being shorter and more secure. I do not know whether it is worth while to allude to what was said about the Channel Tunnel, but perhaps, as the author of several published letters on the subject at the time that the tunnel was started, I may say that the remarks of the gentleman behind me are based upon a great mistake. People who hold his views imagine that those who object to the tunnel fear that the invasion of England could be made through it. That is not their fear, there never was much danger of that kind anticipated; the real danger which would be introduced by the tunnel is this, that in the event of an invasion, the enemy might form a strong *tête de pont* in Kent, and the moment that the tunnel was clear to his rear, an army in France would then support the army of occupation in England, as completely as if there were no channel between England and France. With regard to a pregnant remark which fell from General Collinson, as to the importance of uniting the interests of the Colonies with those of the mother country, there is no doubt whatever that so called free trade legislation has robbed this country of a most powerful means of uniting her Colonies, and I would also say of having *real* free trade within the British Empire. I venture to say that real free trade within the Empire would have done all and much more for us than the spurious and one-sided free trade we now have with countries that do not reciprocate. We should have had a sufficient supply of wheat of our own, with that of all the rest of the world in reserve. Instead of passing those extraordinary Acts which banished reciprocity, and still continue to make it even more remote, which Acts I do not think conform with the ideas of political economists as to the real free trade, certainly not with those of Adam Smith, if we had first attended to the interests of our own Empire, then I think this country would have been to-day in a more prosperous and stronger position. We might at any rate have had real free trade with the Colonies, and more reciprocity from others. Without going further into that subject, which is a bye question here, I must say it is a most extraordinary thing that we should feel ourselves bound by those spurious principles. The shibboleth of so-called free trade is the creature of party politicians, not of statesmen: to charge the same duties upon tea, for instance, grown in India, as we do for tea grown in China, or that we should charge the same duty upon Australian wine grown by our cousins and brethren in that Colony that we do upon the wines grown in France and Spain. What true principle of trade could be infringed by 2d. in the pound less on Indian tea, or if Australian wines should be drunk in England cheaper than those of France? But these slight changes, and such as these, would soon alter the current of trade, increase the wealth of India, stimulate a great interest in our own Colonies, and what is much to the purpose of the present discussion, thereby help to solidify the Imperial connection.

Lieut.-Colonel MOODY, R.M.L.I. (Admiralty Recruiting Department): I wish to make a few remarks on the question of the strength of the Royal Marine Forces in connection with the subject of the lecture now under discussion. The gallant lecturer, in the admirable paper he has favoured us with, points out that a large increase of the Marine Forces will be necessary to enable some of his propositions to be carried out. In this I quite agree. At present the Royal Marine Forces are fixed at about 12,000 men, 6,000 of whom are afloat and 6,000 on shore. These



numbers are just sufficient to provide for the ordinary requirements of the Navy, as out of the 6,000 on shore, recruits, casualties, undisciplined men, reliefs, and employed have to be taken. Whenever, therefore, battalions are required for any exceptional service, such as in Ireland, Egypt, &c., the headquarters are quite denuded of men. Within the time I have been in the Service—about thirty years—I have seen the numbers of the Force fluctuate between 18,000 and the numbers at which we now stand, showing now a reduction of about 6,000 men. From a purely naval point of view there is a reason for such a large reduction: the numbers required in a ship's company in a large ironclad not being more than half what were required in an old line-of-battle ship, therefore the detachments of marines have been reduced in proportion. Formerly a three-decker took 200 marines; a corresponding ironclad will now only require 100. On this ground, no doubt, the marines have been reduced. Raising the question, however, from a naval to an Imperial point of view, it must be considered a matter of regret that such a policy should be adopted. Taking the Annual Report of Army Recruiting for 1883, credit is taken for 33,000 recruits having been raised during the year, which is the largest number, we are informed, that has ever been raised in peace time, and is very creditable no doubt to all those concerned; but even with this large number, on the 1st of January of this year the Army was still 7,000 men short. As the Army cannot recruit up to their number, why not give the marines an opportunity of raising the men who are now wanting for the defence of the country, and who are actually voted by Parliament? Even for purely Naval requirements I consider an increased number of marines might be utilized by filling up the artificer class afloat to a certain extent with them. At present the artificers in the Navy are entered from the shore, and are to all intents and purposes non-combatants, and as the strength of this class is at least 20 or 30 per cent. of the modern ship's company, it would appear a desirable measure if trained fighting men could be obtained for such ratings. The only way I can see to carry this out would be by employing marines, not of course exclusively, but in the ratings for which they would be found fit. As the Officer Commanding the London Recruiting District for Royal Marines, as all marine recruits pass through my hands, I have kept a record these past two years of the artificer recruits who might be made available on board ship, and find in 1882 there were 260, and in 1883 250. These numbers were obtained in the ordinary course of recruiting, without any inducements being held out to the artisan class to join for higher pay and special employment. Should my proposal be ever adopted, I would suggest that the men should be enlisted and drilled as recruits, and be drafted to ships as required, forming part and parcel of the detachment. Thus the numbers of the corps might be increased with, I venture to think, a corresponding efficiency in the *personnel* of the Fleet. The marines would thus, with increased numbers, have the opportunity of serving their proportion of service afloat, without which a marine could not be said to be efficient. With respect to the defence of coaling stations, I take it that a large share of this defence must fall to the marines. This subject has frequently been before the Institution, but I think it has not been recognized how much adapted the marines are for this duty, being as it were almost a complete body in themselves. The force being divided into artillery and infantry, could garrison such stations, reliefs being forwarded readily by men-of-war, and the detachments of the ships on the station being periodically relieved so as to give the men at the coaling stations a turn afloat, and thus keep up their efficiency as marines. To the defence of coaling stations or colonial defences, the marine service, from its great elasticity, is admirably adapted. It matters not, provided ample numbers are voted, whether a detachment of five men and a corporal are required or a complete battalion of 1,000 men; either can be dispatched without delay. It is not necessary to deal with units of companies, half battalions, or regiments; 5 men or 500 can be dispatched with equal facility, perfectly equipped and ready for service, to any part of the Empire. I am surprised that the Colonial authorities have not looked to the marines and endeavoured to obtain their services; as colonists, after completing their term of service, they would be invaluable, as their hardiness is proverbial. Where fortifications will have to be constructed, such as at Port Moodie in British Columbia, not only would the marines garrison such works when made, but they could be employed on their construction in the first

instance. Such work would be a benefit to men who were well grounded in drill and discipline on enlistment. The next question is armed cruisers. I take it for granted the Naval Reserve will man these armed cruisers; but even supposing that you get the Naval Reserve men in sufficient numbers, it will be necessary to have a small but thoroughly disciplined force as a nucleus for discipline on board each ship. What body can supply this force but the marines? Wherever, therefore, warlike gear is kept for these cruisers there should be a force of marines kept to take charge of it, who would find the detachments for the ships when it would be required to place it on board. The last point I shall touch on is the marines as a reserve. The marines are sometimes called the reserve for the Navy, but, as I have shown, they are only a part and parcel of the naval forces required for the ordinary peace requirements of the Fleet. I cannot see in any way how they can be considered in the light of a reserve. A real Marine Reserve might, however, be created from the materials ready to our hand, viz., the men who pass out of the corps annually, 800 to 1,000 of whom I consider would be available. In a few years a marine reserve of 10,000 would be available, the greater number of whom would be settled in the vicinity of our principal naval ports, and who could be called up annually for re-training at the Marine Divisions or Naval Reserve Ships in the vicinity of the men's homes. I believe Major-General Williams, the Deputy Adjutant-General of Marines, is much interested in the question, and I need not therefore go further into the matter. In a similar manner it would appear that the bluejackets who pass through the Service might be utilized with advantage; but this being a question entirely for naval Officers, I leave it for their consideration. In conclusion, I will add my thanks to Sir Charles Nugent for his very valuable and instructive lecture.

Major HAMILTON TOVEY, R.E.: There are one or two points in this most able and interesting paper that I should like to refer to. One is as to the trade route which has been spoken of to Hudson's Bay. Three years ago, when I was in Montreal, this subject was very much talked about, and I conversed with several gentlemen who were interested in the matter. I remember with reference to the question of ice, they quoted voyages that had been made in one or two cases, and proved to their own satisfaction that the passage was open a very much longer time than has been mentioned. Of course they might be disposed to take an optimistic view of it; but on the other hand it is not likely that the people of Montreal would take a very favourable view of any grain trade from Hudson's Bay, as this would be a loss to Montreal. I notice that Sir Charles Nugent and Captain Colomb both spoke of the Inter-colonial Railway as being likely to take a large through trade to the Northern Pacific; but it appears to me that goods sent by that route would have to break bulk twice, and there will be a very long and expensive railway journey, whereas when the Panama Canal is constructed, vessels can go through without breaking bulk at all, and I do not therefore think it is likely that the northern road would be followed. Sir Charles Nugent, speaking of the population of England in comparison with other countries, alludes to a possible time in which the population of England, now about 445 to the square mile, may be equalled by France, which has now 183, and also by Germany and Russia. The position of England is an exceptional one, and one which I think, as General Collinson remarked, has never occurred in history before, and it appears likely to become more exceptional as time goes on. In 1871 the population was 32 millions; in 1881 it was 35½ millions; and, if it goes on at the same rate, by the middle of the next century it will be about 60 millions, and of course will require a still larger amount of food to be imported for its sustenance. We have also the fact that in 1873 there was an excess of imports over exports of 60 millions, increased in 1882 to 107 millions. We know that this has been a subject of great alarm with some people, and it has been argued that we are going to the bad, but it has continued so long that I think we may be sure that this is not the case. Not only have we been paying for this great excess of imports, but from 1871 to 1881 the income from which the income tax was assessed increased some 130 millions, equal to an increase of capital of something like 1,300 millions; so that it is evident that the country not only can pay for its food, but that it is increasing enormously in wealth at the same time. Then we have a most extraordinary condition of things as regards London. During the ten years before the last

census Greater London increased by nearly 1,000,000, or 22·7 per cent. in ten years. If that rate of increase is carried on to the middle of the next century, London will contain a population of something like 22 millions. Of course these numbers may never be reached, but at the same time there does not appear to be any particular reason at present to suppose that the causes which are producing these effects will cease. I quote these figures because it appears to me that England is fast changing from the self-contained country that she has been in the past, and is becoming, as it were, the centre of the whole Empire, not only of the colonies proper, but of India, and the whole enormous area of the Empire throughout the world. London as the capital of England is becoming more and more the resort, and to a large extent the residence of the well-to-do and pleasure-loving population of the whole Empire. If any person living near London will note the character of the population around him he will, I think, find a large number of well-to-do people from Australia, China, and every part of the world, who have come to settle near London. It is evident that as this concentration of wealth continues we shall more and more excite the envy and jealousy of other nations, and London as the heart of the Empire is likely sooner or later to be attacked. France is specially bent at present on establishing an increased colonial empire for the purpose of increasing her wealth and consequent means of paying the interest on her enormous debt. Whether a collision happens or not, there is no doubt that France and England are travelling in opposite directions, and there may be very great danger of it. The above facts tend, I think, to show how essential it is that measures should be taken to maintain our strength if we are to exist at all as a United Empire. In fact, if we are to exist at all, our Navy must not only be a *little* stronger than that of any other country, but must absolutely be able if required to sweep the seas. I should like to refer briefly to the question of fortifications, of trusting the defences of London and our ports to fortifications very hastily throw up by large contractors and so on. I cannot understand how it is possible to suppose that it would be safe to trust to such measures being carried out in a moment of excitement, such as that of an impending invasion. We have a warning of this in the siege of Paris. Paris was already fortified, it was not a question of erecting fortifications, but merely of making those fortifications good in one or two points. Paris was full of large contractors, and as a fact an enormous amount of work was carried out by them; but the most important points, those to the south of Paris, were left unoccupied, and their consequent capture by the Germans compromised the whole defence of the city. That shows what is likely to occur in such a case. The last point I will refer to is this: for the last two or three years it has been my duty to study the question of military organization in connection with history, &c. In doing so I find no difficulty in discovering the military organization of other countries,—Germany, France, Russia,—but when I come to study the military organization of my own country, it seems to me that there is none at all.

Lieutenant-General LOWRY: Every Officer who has addressed you this afternoon has spoken, and most deservedly, in the highest terms of the value of the lecture which we heard from Sir Charles Nugent. I cannot sufficiently emphasize that value. It seems to me that the Council of this Institution would do well to take into their consideration how they could best circulate that lecture, and the important facts and material it puts before us, throughout the country, for I am certain that the more largely the information it has brought so home to our minds is spread throughout this country, the better it will be for her interests. It should be sent to every Member of Parliament, and made to reach, as far as possible, the great mass of those who send Members to Parliament. It should reach and be read in every ship in our Navy, and especially in distant parts of the Empire, so that the importance of the subject may be thoroughly realized and appreciated by the Officers and men on board those ships; and also through the Agents-General it should not only reach, but intimately permeate, the Colonies themselves; for depend upon it, until its vital import to the whole Empire is thoroughly grasped and warmly taken up by the beating heart of the nation, it will never so come home to it as to induce Parliament to adopt active measures. We hear from time to time of a "party cry" with which to go to the country. I know no better cry with which to go to the nation than that which is *no party one*, namely, the all-importance of well

devised, yet simple measures of mutual defence and co-operation to develop and maintain the connection between the mother country and her Colonies. None, assuredly, will tend more to maintain the integrity of the country in the hour of danger, or to link her dependencies more closely to her and to themselves. I heard yesterday from one of my sons, Gunnery Lieutenant of a ship of war on the Australian Station. The ship had visited for several days almost every port in New Zealand, and, before going back to headquarters in Australia, he wrote to me of the enthusiasm the visit of that ship had created throughout the islands—the loyalty that was reawakened, and the earnest desire on the part of all to develop, and to see developed, what they themselves could do for the defence of their own beautiful and prosperous part of the Empire. He said that a good deal of the naval and military teaching which the colonists had received, at one station at all events, was effected by one or two good old retired soldiers. Is it well that this great country, in a place like New Zealand, should rest for the teaching of its sons, or the training of its gunners, only upon such instruction, or even upon the temporary and all too rare visits of our men-of-war, although those visits of our ships of war to such stations are, to my mind, the very life-blood of the country's power? They reanimate the loyalty of our colonists, and unite them more firmly to the heart of the mother country. With reference to the remark which my friend Captain Colomb has more than once put forward, I think, Sir, we should utilize far more than we do our Royal Marine Force, and that there should be schools of naval and military instruction suitably so placed and established throughout all our Colonies. The Governments of Australasia, Tasmania, New Zealand, Fiji, and other Islands acting together, in union with the motherland in this matter of Imperial defence—would so intensify the love and loyalty and earnest endeavour of all our Colonies in those seas, that they would soon rise to the full measure of defence required of them. There is no want of zeal or determination to do it. They only want the intuition of England and the presence of some of her best officers and men in schools of instruction, and on board vessels of war and cruisers on those stations to fulfil their part in "Imperial Defence." Colonel Nugent in his paper has well done his part. Be it ours to see its note of warning has not been sounded in vain.

SIR CHARLES NUGENT: Ladies and gentlemen, at this late hour I do not propose to weary you by replying *in extenso* to the observations which have been made upon my two papers. The gracious manner in which you have received these papers convinces me that the time chosen by the Council of this Institution for placing this subject before you has not been inopportune; perhaps no better opportunity has offered itself for a considerable time past. Before replying to some of the most prominent of the criticisms on them, I may say that those of my hearers who seemed to imagine I did not set a due value on the Navy have misunderstood me. Perhaps I have had more opportunities of becoming familiar with naval matters than other military men of my standing. I served with the Navy for two years, so that with reference to what Colonel Moody just now said, I may almost be termed a marine. The familiarity with naval matters acquired on board ship, while it has not made me less a soldier, has enabled me to become a little of a sailor, and certainly I am the last person to place the Navy in anything but its true position as our main defensive factor; indeed, the object of what has been advocated is to strengthen the Navy so that it may be—and we shall know that it is—as efficient as it is possible to be. It was with much pleasure that I found Admiral Sir Edward Farnshaw agreeing that what had been advocated with respect to the Navy is absolutely necessary, and that if fault is to be found, it is that it is rated too low. Our gallant Chairman in dealing with the military figures upon the previous occasion came to the conclusion that they were not given correctly, being much too low. I admit that they are too low, not only because he knows much more about the subject than I do, but because I purposely took such official figures as are open to all of us, knowing however that they did not represent the full state of the case, but having in my own mind what I conceive to be a fair idea of the full state. Nevertheless I think that what I have advocated is the least that should be done. In reality figures may mean anything, and I may just pause for a moment to say with regard to what Captain Colomb stated of the tonnage going through the Suez

Canal, that in giving the first large figure, I mentioned that some people had said that amount went through the Canal, but that I had been unable to verify the figures, and so had corrected it to what I believe as very near his figure of 82,000,000*l.*, and which figure I have no doubt is correct. With regard to Admiral Ryder's observations respecting the Hong Kong Station, I may say I accepted Hong Kong as our terminal station, not perhaps because it is the most fitting terminal, but because so much has been done there that I did not think it likely that we should abandon it, and therefore it appeared to me more expedient to perfect what had been already done, than to go elsewhere. As to his suggestion respecting Japan, I have no doubt but that he is right. Perhaps I used the wrong term when I spoke of "alliance;"—there are means of working such a country to your own end; a great deal may be done by throwing British officers of both Services broad-cast into a country teeming with population, trusting that their power of organization and example may prove effective. However, I do not set very much store upon Japan; my observation was suggestive. As to the distance apart of coaling stations, I must confess it occurred to me that 2,500 miles was too far; but in this matter it is necessary to sacrifice something, for we cannot have our ideal, and I do not think we shall ever have coaling stations near enough one to the other to satisfy the needs of vessels of the "Alexandra" type. It is however the case that some of the cruisers now on the stocks, and which may be expected to be launched during this and next year, will carry coal for 6,500 miles steaming. Of course in a subject like this it is necessary to give some facts in support of what has been said, indeed without facts the utterances of a more able lecturer than I am might not carry weight. The gallant Member for Gravesend seems to think that modern merchant steam-vessels have not beam enough to enable them to carry guns. Perhaps some may not carry them very efficiently, but I think that under certain circumstances, and with a certain amount of preliminary preparation, a good deal may be got out of them; and I feel that in this I am taking up the naval position, because the First Naval Lord of the Admiralty, Sir Cooper Key, said that the Admiralty had made arrangements with respect to the vessels of the Great Star Line which would at least give the country something to rely upon in time of necessity. With regard to blockading and convoying, I think both the naval Officers who criticized what I said to a certain extent misunderstood me; if they will kindly read what I did say, they will find that I said that steam had rather put us to a disadvantage as blockaders as compared with the blockaded. Of course I speak in this manner with much deference to naval Officers; indeed what I said was rather with a view of eliciting what was the exact state of the case than that my poor opinion on naval matters should be accepted. Admiral Boys's view of our position as blockaders we may take as authoritative. It is rather a case of fleet watching fleet, although you may call it blockading if you like, but in the present day you never can prevent single vessels slipping out and preying on your commerce. With regard to convoying I speak with still more deference; but to a landsman it appears that under such circumstances as Admiral Boys mentioned, convoying may be turned to considerable account. With regard to the wheat traffic from the Manitoba district and the Saskatchewan River, from what I have read on the subject I believe the Hudson's Bay route is open considerably more than six weeks in the year. Those who favour that route, those who are to benefit commercially hereafter by the wheat-growing operations in that district, say that the Hudson's Bay Company for a long time exaggerated the difficulties and dangers of the Hudson's Bay in order—they having a monopoly of the fur and other trade in that region—to prevent outsiders getting in. We know such things have been done before, and perhaps there may be some little truth in that. One of the reasons why I advocated the force of marines was because I believe that recruiting officers of marines have a stratum to work in which the Army does not touch. I believe the force of marines could be augmented up to 20,000, 25,000, or 30,000 without interfering with army recruits; and I think that the proposal to put reserve marines, or indeed reserve soldiers and sailors, in the Colonies, who shall be granted favourable terms of settlement on condition that the Colonies have a lien on their services in the event of war, is one which may be easily carried out, and is quite worthy of attention. I have here a letter from Captain Mill, the Agent-General of the Cape Colony, who is unable to be present,

in which he desires me to say how thoroughly he backs the proposal made in the paper to have an independent submarine cable from England to the Cape, and from the Cape up to India; and he also says that when that question was first mooted some years ago, the Cape Colony, not being a very rich Colony, and having a great many troubles of its own on its hands, did propose to subsidize the submarine cable communication at the rate of 20,000*l.* a-year, but that political exigencies at home prevented the Home Government from acceding to this proposal on any terms which the Cape Government would agree to. Well, it seems to me that proper telegraphic cable communication is one of the most important factors in this project of defence, in fact in war time very much will depend upon a proper use of cable communication. Colonel Crossman has alluded to the way in which the money for these defensive measures may be raised, and I am sure from my experience of the Defence Loan of 1860, upon the completion of which I was engaged under our Chairman, that a loan is the best and most economical way of providing the funds for carrying out large works of this nature. It is not only that at starting you are absolutely certain of the whole money, but that you are able to make more satisfactory arrangements with the contractors, and so are in a better position to carry out work successfully, knowing that the money at your disposal is always there, as it cannot lapse if unspent, as it does under ordinary circumstances in military estimates from year to year. To go back to the point of coast defence vessels, Lieutenant Tupper, and I think some other naval Officer, found fault with me for advocating that such vessels should not have much steam power. I quite agree that they would be more efficient all round if they had ample steam power; but my object in advocating such limited mobility was to render it more certain that they should always be on the spot when they are wanted, fearing lest—if they had steam power sufficient to enable them to take a prominent part in squadron operations—they might be withdrawn from the place for which they were designed before the time at which they were designed to act arrived. There was one other observation of Admiral Ryder's to which I desire to advert to. He commented upon, and, if he will allow me to say so, with perfect justice, the inexpediency in marine defences of constructing forts with very great numbers of guns. There may of course be places where you require a fort with a very great number of guns; for instance, if the only way you can defend a large open water is by placing one fort on a shoal in the water, a case in which you require to concentrate great strength at the spot; but, as a general rule, I agree with him that a number of scattered forts having comparatively few guns are much more destructive to attacking vessels, especially if those guns are placed at different elevations. I desire too to re-echo how well the Australian Colonies have responded to the necessity of caring for their own defence. I may say that I have some little knowledge of what they have done, because some of the designs came to the office over the way when Sir Lintorn Simmons was Inspector-General of Fortifications, and I had opportunities of seeing them. I can thoroughly endorse what Colonel Drury said so well, especially as to how much the Colonies owe to Inspector-General Scratchley; how well he has worked all through, both professionally and politically, I know from what I have seen. I have had many letters from him, and have read his addresses to the volunteers, and he had a considerable amount of difficulty in carrying things out in the way he felt that they should be carried out. I thoroughly agree also with Colonel Drury that the initiative in organization should come from England. I think, ladies and gentlemen, I have answered all or nearly all the questions that have been raised, and it only remains for me to express to you my grateful appreciation of the very kind manner in which you have received these two papers.

The CHAIRMAN: Ladies and gentlemen, it is so late that I will make but very few remarks upon the subject which has been under our consideration. I think you are all agreed that the lectures that have been given by Sir Charles Nugent are of the most admirable character, and I may add that the discussions that have followed have been most valuable. I only wish that the matter that has been brought before this Institution in these discussions could be thoroughly well known and considered throughout the country, for I am one of those who believe that the Government, whichever party is in power, will always remain supine unless public opinion can be brought to bear upon it. I believe also that we are as a nation so



inclined to give way to our own selfish inclinations and amusements, that we are very apt to neglect great national questions that involve self-denial in the shape of increased expenditure. I only wish, therefore, that the facts connected with the subject of our defences were thoroughly understood throughout the country. One of the most interesting points brought out in this discussion, and one which as Britons we consider ought not to admit of doubt, is that, as long as we hold together, the Britain within these four seas, and the Greater Britain in all parts of the world, are strong and capable of meeting any attack that can be made upon us, provided we have marshalled our forces and prepared them to meet the enemies, wherever they may be. But I am sorry to say that we have not marshalled our forces, that we are not organized as we ought to be for defence—far from it, neither at home nor throughout the Greater Britain beyond the seas. In the observations I made on the occasion of the first of these lectures, I ventured to say something about the defence of our coasts, and in it I remarked on the deficient strength of our Navy. The fleet no doubt is our first line of defence, whether we consider the question as it regards our home country, or whether we consider it with reference to our distant Colonies. This our first line of defence has been spoken of by so many in this room, that in summing up, having heard nothing to the contrary, we can arrive at no other conclusion than that our fleet is lamentably deficient in strength. That is the opinion expressed by the lecturer, and it has been repeated by Officers of the Royal Navy of the highest distinction, among whom are distinguished Admirals who have lately held high official positions at the Admiralty. I think, therefore, we may accept it as an established fact. When we consider the defence of Greater Britain, the fleet is a most important factor. The chief defence of our many important possessions beyond the seas is not local; it may so happen that the blockading of a fleet in some port thousands of miles away from any given Colony, as for instance from Australia, may be as practical and even a more thorough defence for the Colony itself and its trade, than would be afforded by a larger fleet on its coasts. The only great war in which we have been engaged in my time was the Crimean War; what was the state of things then? The seas all over the world were as safe to British merchantmen as if they had been sailing on one of the lakes in Cumberland, because the Russian fleet could not keep at sea. If we could keep the fleets of other countries with which we might be at war in a like condition, our commerce would be equally secure. But it so happens the Russian fleets in those days were almost entirely confined to the Baltic and Black Seas; they were therefore easily blockaded, and the Russian flag did not fly on the open sea at all. But we cannot expect such to be the case in a war with one or more of the great maritime Powers. I venture to think it would be impossible to blockade the ships of war of the great maritime Powers; and if we could not do so, what would be the conditions under which we should have to carry on our commerce? What would be the effect upon marine insurances if a few merchant ships were captured? Premiums would go up to an alarming extent, and where would be trade? Freights would rise, and it would be accordingly very difficult to keep up the food supply for this country, with reference to which I think there can be no doubt, as General Collinson and others have remarked, that our demands are steadily increasing, whilst our home-grown supplies are decreasing; and therefore the question from day to day becomes more important to us. In the event of a war in which our seaborne food supply was cut short, we should be very much in the position of the garrison of Paris when it was blockaded: it would be a question of time when we should be on our knees seeking for peace. Therefore I think it is of great consequence that we should increase our fleet, and place ourselves in a position to give us every prospect of maintaining our commerce throughout the world, in spite of any foes.

A good deal has been said about federation of the Colonies with the Home Country, but I think that this question is not perhaps ripe for decision, and it will not do to put off the question of defence till that question has been settled definitely. Already we have an instance in the Australian Colonies, which have come forward nobly in carrying out works of defence, and I was delighted to see Colonel Drury, who commands the Volunteer Forces in one of these most important Colonies, speaking in this room. They have come out nobly in their efforts to organize defences in the several Colonies, but they require federation at any rate so far as

military matters are concerned. We could hardly expect to carry on federation throughout the great British Empire in all parts of the world until separate Colonies have followed the example of Canada, and confederated among themselves. I was on a Royal Commission which was appointed to consider the question of, and has reported on, the protection of our commerce and Colonies, and therefore my tongue is tied as to the particular measures that ought to be taken. We closed our operations about two years ago, but I am sorry to say nothing whatever has been done to carry out any one of our recommendations; at least I cannot find any trace in the Estimates of anything having been done. The "Times," I believe, has stated that a loan of two millions was likely to be raised for the purpose of our defences at home and abroad. All I can say is that this sum is totally inadequate for the purpose, and I hope and trust that no Government in this country will propose a loan that will not suffice for the execution of the necessary works in a thoroughly satisfactory manner. Fortifications and defences of an imperfect character are almost worse than no defences at all; they are a snare and delusion; and I believe the country would be as, or even more, willing to grant a somewhat larger loan, which would suffice to do the work well, as to grant a smaller loan which would only suffice to do the work badly. It does not follow if the loan be granted that the money will be expended or even raised at once; it need only be raised as the works proceed; and we know that in the case of Lord Palmerston's loan for home defences, it took many years to carry them out. I should hope that the colonial defences would not take so long, but I am perfectly certain of this: that all the defences recommended by our Commission are absolutely necessary, and ought to be carried out with the least possible delay.

Then as to having very short runs between our different coaling stations which has been recommended by several speakers, I think it very important that this question should be carefully weighed. No doubt the position of this country, with territorial possessions in all parts of the world, is exceedingly strong, because we can have coaling stations everywhere sufficiently near to each other to make the intermediate runs easily; but it cannot be too strongly insisted upon that wherever we have coal it must be protected; otherwise the supply may be as useful to an enemy as to ourselves, and we ought clearly not to establish or maintain coaling stations for our enemies. Wherever, therefore, we maintain stores of coal, we must defend them. If we cannot defend them they ought to be destroyed or removed, but no coal ought to be allowed in any part of the British possessions on the sea-coast unless it is capable of protection and defence. Now what does this involve? It involves not only fortifications but garrisons; the fortifications can be provided by the expenditure of a certain limited sum of money, which can be raised by loan; but men are more difficult to provide, and require an annual expenditure. Besides, the demands on our Army are so great that we have not troops to garrison numerous distant stations. It is therefore necessary to keep down the number of coaling stations to the utmost, and in doing this, great care and judgment must be exercised to select those positions which are best adapted, not only for Her Majesty's Navy, but also for the commercial marine. It therefore seems to me that for these reasons many of the coaling stations which have been recommended by speakers must be dropped out; not that they are not desirable, but that the demands upon us are so great that we should be unable to maintain them in security. Again, when it becomes necessary to establish coaling stations in our great Colonies, we must naturally look to them for assistance, which they can render most materially, in providing the garrisons. They can assist by granting the necessary land, by constructing the works, and arming them; but above all they can assist by providing men for their defence; and every encouragement ought to be given to the Colonies in which these stations are placed to train men and make them fit to garrison their defences by the aid of a small nucleus of Imperial troops who could give them instruction in the work they would have to do.

As to submarine telegraphs to our Colonies, nothing can be more important than that we should have them; they are and will be of the greatest use, especially on the outbreak of war, but I doubt very much whether they will be to be depended upon to send instructions and conduct operations after war may have broken out; the value of them, however, cannot be exaggerated at the moment of the outbreak of

war. Notice might be given of a hostile squadron in any given position, and the Colonies might be urged to mantle and man their works and put them into a proper state of defence; ships also might be moved, and squadrons assembled at first; but the facilities for cutting wires, even in deep seas, are so great, that I do not think it would be wise to place any reliance on them after war had commenced. Then with regard to the employment of our mercantile marine, I believe that there are at this present moment upwards of sixty steamers afloat from 3,000 to 9,000 tons, some of them capable of steaming 16 knots, and one or two even 20 knots. These are splendid ships; and I must say I do not participate in the fear of Captain Pim, that they might be too top-heavy to carry a moderate sized gun or two; on the contrary, we have the torpedo-ship; the "Hecla," which was one of them, was purchased by the Admiralty, and now carries guns upon its decks; and I think these large ships would be quite equal to doing the same thing. I know it is proposed to have guns at distant stations to be placed on board such ships when required. Now I do not believe in guns in distant stations. The supply of their fittings would create delays, at a moment when it would be of the utmost consequence there should be none, and when fitted, the crews would not be trained. I therefore believe it would be much more profitable to have a volunteer fleet, and to place the guns on the ships beforehand, in peace time, with a naval gunner or two to look after them, who could instruct the crews, or portions of them, so that wherever the ship was when war broke out, she would be able to do something for her own defence. It does not require many men to work a gun, eight or ten hands would suffice to do it perfectly. If this were done, these would be most valuable ships, not only for commercial purposes, for mail service, for keeping up communications with the Colonies, but, while traversing the seas, they would be the best scouts for the Navy, bringing information to the coaling stations and places of rendezvous of the Navy, of any hostile cruisers or squadrons which might be hanging about on the great routes for commerce. They would not be fit to fight an enemy's ship of war, but would certainly be equal to any ship of a like nature fitted out by an enemy. I believe that the grant of a few privileges, and the promise of preference in Government employ, would induce owners to enrol their ships and have them armed as members of a volunteer fleet, and that the commanders would make themselves fully competent for their command, subject to such limitations in their commissions as the Government might approve. The command of a vessel so armed would be equivalent to that of a battalion in the land service. I will now ask you to give a vote of thanks to Sir Charles Nugent. I am sorry to say that, since his first lecture, he has been put upon the shelf, and that the time is coming very shortly when, by recent regulations, he will be placed on the Retired List. I am sure you will all join with me in regretting that the regulations of the Army are such that the country will be deprived of the valuable services on its active list of one of the best Officers it possesses, of one who has accumulated a mass of professional information which, I believe, is totally exceptional; who has the talent to turn that information to useful account for the benefit of the country; and, who, moreover, as you have seen, is still possessed of energy and strength which might well be envied by many a younger man.



Friday, May 2, 1884.

ADMIRAL A. P. RYDER in the Chair.

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ON LIBRARIES CONSIDERED AS SUBSIDIARY TO  
EDUCATION, AND ON THE BEST MEANS OF DIF-  
FUSING INFORMATION AMONG THE OFFICERS AND  
MEN OF HER MAJESTY'S NAVY.

By Captain SAMUEL LONG, R.N.

IN bespeaking your indulgent criticism for the inevitable shortcomings of this paper, I may observe that it was originally suggested by the remark of a brother Officer,<sup>1</sup> that we had no Officers' libraries afloat, and that the occasion appears favourable for a review of the origin and present state of our libraries, and for discussing other questions connected with them.

I will here express my thanks for the kind assistance I have received from the Rev. J. B. Harbord, Chaplain of the Fleet, Rev. W. E. Smith, Director of Naval Schools, Mr. Lewes, the Director of Victualling, and especially to Mr. Grant Wilson, of that department, who have each and all afforded me invaluable aid, and the latter of whom has for many years been an able and steady friend to the seamen's libraries.

I. In the word library we have a record of the fact that books were once written on the bark of trees, and bark is still largely used in the manufacture of paper.

The history of books may perhaps be roughly divided into three main divisions:—

- (a.) The age of papyrus, from the earliest times to about the 7th century A.D., though parchment was used both in Persia and at Pergamus about 190 B.C.
- (b.) The age of parchment and manuscript, which extends from the 7th century A.D., to the discovery of printing at Mentz, 1442 to 1450. Block printing, however, was discovered in China about A.D. 593, and movable types were made there in the 10th century.<sup>2</sup>
- (c.) The age of printed books, which begins for this country with

<sup>1</sup> Captain R. M. Blomfield, R.N.

<sup>2</sup> "The Middle Kingdom." S. Wells Williams.

the first printing press set up at Westminster, by William Caxton, in 1471.

The ancient history of libraries is interesting, but foreign to my subject, and I will only here mention as one of the earliest the famous library of Ramses I of Egypt, founded about the 14th century B.C., and over which is said to have stood an inscription, meaning<sup>1</sup> "the dispensary of the soul."

Passing on to our own country, we find that the Chetham Library, at Manchester, founded by Humphrey Chetham, in 1653, was the only free library in a strict sense, prior to the passing of the Free Libraries Act, brought before the House of Commons, in 1850, by Mr. William Ewart.

There are five libraries in the United Kingdom possessing copy-right privileges, viz., the British Museum; the Bodleian, at Oxford; Cambridge University; the Faculty of Advocates, Edinburgh; and Trinity College, Dublin.

There are numerous subscription libraries, but I shall only notice free rate-supported ones. Of these there are more than 84 established in different towns of the United Kingdom. Upper Canada has 77 in towns and 465 in counties.

Great Britain compares very unfavourably with the United States in this respect, for it appears from the Report of the United States Commissioner of Education for 1881 that there are now nearly 4,000 libraries, consisting of more than 300 books each, making a total of 13,000,000 volumes.

Mr. Edwards<sup>2</sup> states: "The free libraries had achieved, even as early as 1855, an amount of educational and social work theretofore in any like channel unexampled. Every step in their progress is directly traceable to these two great principles—1. Permanent support by a permanent rate. 2. Express (though of necessity gradual) adaptation to the requirements of all classes of ratepayers without any exception."

There are<sup>3</sup> more than 340 free town libraries in France, and Dr. Petzholdt enumerates 1,547 of all kinds in Germany. The above facts appear to show conclusively that the advantage and even necessity of libraries has been acknowledged by the Legislatures, both Imperial and municipal, of the principal countries of the world.

Some idea of the multitude of works now offered to the public may be formed from the fact, for which I am indebted to Mr. Bullen, of the British Museum, that an annual average of 6,924 new works has been received there under the Copyright Act during the last six years.

II. Education means the drawing out of the powers of the mind. John Locke wrote, in 1692: "A sound mind in a sound body, is a short but full description of a happy state in this world. . . . I think I may say, that of all the men we meet with, nine parts of ten are what they are, good or evil, useful or not, by their education."

<sup>1</sup> Sir J. G. Wilkinson.

<sup>2</sup> "Free Town Libraries," 1869. By Edward Edwards.

<sup>3</sup> "Encyclopædia Britannica," 9th Ed. Art. Library.



John Milton, in 1644, wrote: "I call therefore a complete and generous education, that which fits a man to perform justly, skilfully, and magnanimously all the offices, both private and public, of peace and war."

The historian Gibbon, in his autobiography, expresses the opinion that every man has two educations, that which he receives at school and college, and that which he gives himself, the latter being the most important.

This opinion appears to be shared by some teachers at the present time,<sup>1</sup> and whatever may be true of people who devote ten years or more of their life to education, it can scarcely be doubted that the course of study laid down for naval Officers, from the date of entry into the training ship until their attainment of the rank of Sub-Lieutenant, not only leaves room for, but implies, that much subsequent study will be required, if an Officer is to qualify himself for the higher ranks of his profession.

Sir Charles Shadwell's Committee on the higher education of naval Officers, 1870, remarked in their Report: "In the foreign navies there is hence no necessity to make provision for subsequent adult education, or professional improvement in after years, which, under our system of early entry and limited training, becomes very essential, and of paramount importance."

Again we find from the Report of the Rev. Osborne Gordon's Committee to enquire into the establishment of the Royal Naval College, Greenwich, dated March 24th, 1877, that "the amount of knowledge implied by the 3rd class certificate of a Sub-Lieutenant is a very elementary amount."

The foregoing may suffice to show the importance to naval Officers of facilities for self-culture, which is a lifelong concern of the greatest personal as well as professional import. John Locke wrote about 1689: "He is little acquainted with the understanding who does not know that as it is the most elevated faculty of the soul, so it is employed with a greater and more constant delight than any other."

III. The recent progress and present condition of the seamen and marines of the Fleet is clearly shown by the admirable Report presented to the Admiralty by the Rev. John B. Harbord, R.N., in 1881, from which I quote the following:—

"The seamen and marines of the Fleet are as a body better educated than the classes on shore whence they are drawn. The marines are not so advanced as the seamen. A considerable improvement has taken place of late years, which is most marked in the case of the marines."

After pointing out that the most important period of schooling for seamen is when they are 2nd class boys, and for marines when they are recruits at the dépôt, the Report states: "On board seagoing men-of-war, the opportunities for school are of a precarious nature; but nevertheless many ignorant men avail themselves of the opportunities

<sup>1</sup> "Essays on a Liberal Education," 1868. W. Johnson, Fellow King's Coll., Cambridge.

for improvement, while the assistance of the schoolmaster is frequently sought by the better educated who are looking forward to advancement."

"The education of seamen, from boys to warrant officers, should be treated as a whole, connection and continuity being preserved throughout."

The statistics furnished by Mr. Harbord for the fifteen years 1866-1880 inclusive, show that the number of petty officers in the fleet has increased by 1,797 during those years, the percentage of total force holding petty officer ratings in 1866 being 14.3, whereas in 1880 it was 19.2.

These statistics show an improvement in the case of petty officers as follows:—In 1866, 75.6 per cent. could read well, whereas in 1880 87 per cent. can read well.

In 1866, 62.5 per cent. could write well, whereas in 1880 78.8 per cent. write well.

Only one petty officer in 200 can neither read nor write, and of these some at least are not English.

In the case of seamen, whereas in 1866 61.8 per cent. could read well, 74.1 per cent. can do so in 1880; also in 1866 50 per cent. could write well; in 1880, 65.5 per cent. can do so.

In 1866, 11.5 per cent. of the seamen could not write at all; in 1880 only 3.4 per cent. are so returned.

The percentages for the boys show that in the future the average of education will be higher.

Turning to the marines, in which term non-commissioned officers are included, we find that whereas in 1866 only 49 per cent. could read well, in 1880 66.3 per cent. could do so; also that in 1866 only 38 per cent. could write well, in 1880 61.3 could do so.

Mr. Harbord remarks: "Upon consideration of the above results, the conviction is forcibly pressed upon us that the educational improvement of our petty officers and seamen is due chiefly to the advantages they enjoy while in the Navy itself, and has been affected very little by any progress in the elementary education of the country at large."

Again: "In discussing the question of the education of adults of the class whence our seamen and marines are recruited, the early age at which they leave school as children should be borne in mind. When a youth arrives at the age of seventeen or eighteen years, in a large number of cases he will apparently have forgotten the little he had learnt before the age of twelve years. If he does not voluntarily continue his education, and have aids for doing this within his reach, he will eventually swell the number of indifferently educated or ignorant men."

The foregoing extracts, to which may be added the fact that the present authorized course for seamen at the gunnery schools approximates to what was required of Sub-Lieutenants thirty years ago, may be sufficient to show that a supply of sound and various literature is likely to be more and more appreciated by the seamen and marines of Her Majesty's fleet.

IV. A survey of the libraries open to Officers and men of Her Majesty's Navy must now be taken, and a rough guide as to the scope of a naval library appears desirable.

It has been well said that every man is concerned about his religion, the politics of his country, and his own particular business in life, which in the case of naval Officers covers a wide variety of subjects.

It appears that prose fiction forms about 75 per cent. of the issues of popular libraries, a fact which must not be lost sight of.

Here perhaps Lord Bacon's essay<sup>1</sup> on studies may be referred to, as containing much wisdom in small compass, for there can be no doubt that in these days of superabundant printing, an exclusive criterion is quite as much needed as an inclusive one.

The wide extent of a naval Officer's professional field of study may be gathered from the Admiralty Minute of 1873 establishing the Royal Naval College at Greenwich, as well as the Report of the Committee on its establishment which sat in 1877, and for scientific research the "Admiralty Manual of Scientific Inquiry" is a guide.

For those, however, who possess neither the inclination nor aptitude for scientific research, there remains a wide field of almost necessary study. For instance, the previous voyages to, and history of, the countries conterminous with our naval stations, the development of trade, naval strategy and tactics as illustrated by history, together with the effect thereon of changes in material and progress in the arts of war.

Captain John C. R. Colomb's (R.M.A.) valuable lecture delivered here in May, 1881, may be referred to with advantage on the latter subject.

There is perhaps no other profession involving such numerous and diverse subjects of study, in each and all of which we must look to our libraries for aid towards proficiency, and among which every one must find something attractive.

The libraries open to naval Officers consist at present of that at the Royal Naval College, Greenwich, and those afloat.

The Admiralty library of about 25,000 volumes is well catalogued and may be consulted, but there is no reading-room.

The War Office library may, I believe, be consulted; it is growing rapidly, for last year 700 new works were added, and it must now approach 30,000 volumes. It is admirably catalogued, and though the books are dispersed in different places, they are at once obtainable, owing to the admirable system adopted.<sup>2</sup> The catalogue is itself a study.

The library of the Royal Naval College consists at present of 5,209 volumes distributed approximately, as shown in Table, p. 8, from data kindly supplied by Mr. Huskisson. The catalogue is very inferior to the two above mentioned.

New books are added from time to time when requisitioned. In

<sup>1</sup> "Bacon's Essays." Morley's Universal Library. Price 1s. Not in Library.

<sup>2</sup> "Catalogue of the War Office Library," 1883. Compiled in the Intelligence Branch of the Quartermaster-General's Department.

old books, however, it is deficient, as may be seen from the fact that the Admiralty library contains 81 works on various parts of the China Station, while the Royal Naval College library contains only 25.

We must ask the attention of our friends to this matter, if the library of the Royal Naval College is ever to rival those of older institutions of a like character. There are 13 colleges at Oxford and 6 at Cambridge containing libraries of over 15,000 volumes, and it is perhaps not too much to hope that the Royal Naval College library may one day contain every valuable work, either on naval history, voyages and travels, or naval science.

In Mr. Ewart's speech in 1850, the probability of acquisitions under the wills of public spirited persons was referred to, and has since been exemplified in many instances, and surely no institution can be more worthy of support than the headquarters of the Naval Service—*e.g.*, 1½ millions sterling was given for educational purposes in the United States, America, during 1881.

Among the numerous services for which this nation is indebted to the late Prince Consort the Officers' library at Aldershot may be mentioned, as a proof of the importance attached by him to a ready access to books.

There is one department, however, in which a deficiency, easily and inexpensively remediable, exists. I refer to works published at the public expense, *viz.*, Diplomatic and Consular Reports and Reports of Parliamentary and other Committees.

On this subject the Report of a Committee of the House of Commons dated July, 1853, is explicit. It states, "In conclusion, the whole of the evidence received has led your Committee to form a sanguine expectation of the beneficial results to be derived from a liberal distribution of the stores of information annually collected by Parliament."

Mr. Edwards remarks: "This recommendation applies to the very important publications of the Boards of Admiralty and Ordnance."

To show what is involved in this, besides an annual Report from each of Her Majesty's Consuls, and frequently from Her Majesty's Ministers abroad, I have inspected the index to Parliamentary papers for the years 1870–1882 with the following result. With reference to naval subjects there were printed during this period, two Reports of Select Committees of the House of Commons, 20 Reports of Admiralty Committees on special subjects, and 110 characterized as accounts and papers. Many of these possess no lasting interest, but I will instance some which no important naval library should be without.

Date.	Subject.
1870....	Report on Education of Naval Officers.
1871....	Report of Committee on Designs of Ships of War.
1871....	Papers on the loss of H.M.S. "Captain."
1874....	Correspondence respecting the Proceedings of Her Majesty's ships on the south-east coast of Spain.
1876....	Court-martial on loss of H.M.S. "Vanguard."
1876....	Royal Commission on Spontaneous Combustion of Coal.

Date.	Subject.
1878....	"Inflexible" Committee.
1880....	Final Report of Committee on Boilers.
1881....	Report of Committee on loss of H.M.S. "Atalanta."
1883....	Report of Committee on Explosions of Gas in Coal-bunkers.

The printed indices to Parliamentary papers should be in the library, so that any inquirer can see what papers on his subject are available.

The home ports come next in importance to the Royal Naval College as naval centres, but here there are no libraries on shore, though at Portsmouth there is a room fitted up as an Officers' library. At Sheerness Barracks, the Officers have a private library, and also the petty officers.<sup>1</sup>

Sec. 2. Turning now to libraries afloat, we find that books supplied for the use of Officers and men fall under two categories:—

1. Those supplied to the Commanding Officer from the Departments of the Hydrographer and the Director of Victualling.

2. The seamen's library supplied from the latter department.

Under 1, besides sailing directions and manuals of deviation, are included, establishments, store documents, and current technical works of various kinds. The remainder consist of 22 volumes of law and treatises, and 5 on art and science.

Long before seamen's libraries were instituted, it appears<sup>2</sup> from the Naval Chronicle of 1816 that Lieutenant Baker and Dr. Quarrier, of H.M.S. "Leander," then fitting out at Woolwich, proposed the formation of an Officers' library on board their ship, and offered to contribute thereto their own libraries, consisting of some hundreds of volumes.

We owe the first seamen's library to the exertions of the well-known philanthropist, Mrs. Fry.

This appears from the Report of a Committee presided over by Admiral Sir Jakleel Brenton in 1836, with the object of providing the Coast Guard of the United Kingdom with libraries of religious and instructive books.

In 1835-36 a sum of 960*l.* was obtained from Sir Robert Peel's Government, and with grants from various societies of 1,006*l.* and subscriptions of 770*l.*, no less than 40,643 volumes were distributed among the various Coast Guard stations and cruizers in the proportion of 42 to each cruizer, 52 to each station library, and 400 to each district circulating library.

Sea-going libraries were sanctioned by the Earl of Minto's Board of Admiralty on July 2nd, 1838, when large ships were provided with 276 and small ones with 156 volumes, chiefly of a religious character. These were enlarged by an order of the same Board on

<sup>1</sup> I am indebted to the Rev. R. O'D. Ross-Lewin, R.N., H.M.S. "Duncan," for this and other valuable remarks.

<sup>2</sup> I am indebted to Mr. Hooper, Librarian to the Admiralty, for this interesting fact.

*Free Libraries for Officers and Seamen of Her Majesty's Navy.*

Class.	Typical ship or dépôt.			Number of each class issued.	Number of separate volumes in each class.	Total number of volumes in each class.	Remarks.
	Name.	Number of Officers. <sup>1</sup>	Number of men.				
A	Royal Naval College, Greenwich.....	203	nil	..	5,209	5,209	
B 1	Portsmouth .....	315	4,767	..	..	..	Four first class libraries afloat, besides special allowance to "Excellent" and "Vernon" for scientific books.
B 2	Plymouth .....	152	6,356	..	..	..	Same and special allowance to "Cambridge."
B 3	Sheerness .....	58	..	..	..	..	One first class library at barracks.
	Chatham .....						
1	"Alexandra" .....	57	647	16	813	13,008	
2	"Triumph" .....	45	442	14	768	10,752	
3	"Curacoa" .....	28	239	28	581	16,268	
4	"Fantôme" .....	11	115	51	404	20,604	
5	"Moorhen" .....	7	53	72	277	19,944	
						Total of volumes afloat 80,576.	

<sup>1</sup> Warrant officers are included in sea-going ships, but not at home ports.



December 9th, 1840, and Lord Haddington's Board in December, 1841, established libraries at the marine divisions, to which a grant was made.

Under memoranda dated October 29th and November 16th, 1861, respectively, the Duke of Somerset's Board constituted a Committee consisting of our present Chairman, Captain, now Admiral, Coote, and Professor Main, which inquired into the state of the seamen's libraries, and a circular was issued on July 29th, 1862, in which the recommendations made by them were ordered to be carried out.

The catalogue of that year contains for the first class 457 volumes.

In 1869-70 the library was revised by the Rev. W. Guise Tucker, Chaplain of the Fleet.

In February, 1882, a Committee composed of nine chaplains, the Secretary to the Commissioner-in-Chief, two Lieutenants, and three naval schoolmasters, sat at Plymouth by request of Mr. Cawston, Chaplain of the Fleet. They recommended that a library should be made up in sets of 250 volumes each, composed of a fixed proportion of books of different classes as follows:—Fiction, 125; Science and Art, 20; Poetry, 10; Humour, 10; History, 25; Geography and Handbooks, 25; Miscellaneous, 35, with a view to facilitate exchange of libraries afloat, which was not thought practicable by Admiral Ryder's Committee. They also revised the list.

On this Mr. Cawston remarks: "What is wanted is a more frequent and complete revision of the library itself, as to works of fiction and works which will only bear reading once especially. Any revision which would approve itself to the Service at large must be the work of a Committee representing all classes concerned."

Mr. Grant Wilson points out difficulties in the way of organizing libraries in sets, and also that Admiral Ryder's Committee and Mr. Guise Tucker both took up and abandoned the idea of interchanging libraries. There would be a danger that as the crew of a ship come from various sources, they might find a repetition of the library they had just left. In this way and by failures to exchange, the small ships might not gain anything by having their library in parts.

The present establishment of the seamen's library is given in the table; the Accountant Officer has sole charge of it, and the rules concerning its use are laid down in Art. 1734, Secs. 6, 7, and 8 of the "Queen's Regulations and Admiralty Instructions."

In Mr. Harbord's Report before alluded to we find as follows:—

"5. The seamen's library has not come under my department, and there are no Returns or information upon which I am called upon to report. It is referred to here in connection with the schoolmaster's duties. In the 'Report of Inspection' (Form S, 161 D) by the senior Officer, the question is asked, 'Have the books of the seamen's library been issued according to the regulations?' This is sufficient to ensure that the library is made use of. Whenever I have personally inspected the school of any ship, I have looked into every part of the schoolmaster's duty, and have therefore examined the issue

record kept by him. Some of these show that considerable use has been made of the library, but others indicate that the opportunity has not been taken advantage of as might have been expected. In harbour ships this is especially observable. It is easily accounted for from the fact that the majority of the men on board these ships live on shore. The books being impressed with the Government mark cannot be taken out of the ship, and the water police would stop any man having one upon his person. I cannot but think more elasticity might be introduced in the management of these libraries, and the men allowed the use of them in their homes. The existing regulations would be sufficient to guard against any loss or damage.—'Queen's Regulations and Admiralty Instructions,' Arts. 1734-5.

"Most of the harbour ships have compartments or portions bulk-headed or screened off, which at the proper time are appropriated as reading and recreation rooms for the men. In many sea-going ships the school screen is used for the same purpose.

"The Admiralty supply ships abroad with newspapers and periodicals for the use of the men.

"In the training ships the boys have their own libraries, which by the regulations are for their exclusive use. These libraries are all independent, and each of them contains well-chosen books, both instructive and attractive to the boys, with periodicals and papers. It is bought and kept up by a subscription of 2*d.* a month from each boy, this sum being charged with the first weekly payments made in each month. The amount is placed in the hands of the Chaplain, who, with the assistance of the head master, manages the fund. One of the other schoolmasters is appointed to keep the catalogue and issue the books. These libraries are much used and appreciated by the boys.—'Regulations for Boys' Training Ships, Art. 57.'

"After school hours the schoolrooms are thrown open to the boys; they are well lighted in the evenings to enable those who desire to do so to write letters, to read books and papers, or to amuse themselves with the quiet games furnished for the purpose.—'Regulations for Boys' Training Ships,' Art. 56.

"The Royal Marine Barracks at the *dépôt* and divisions are provided with means of rational amusement and improvement in the way of libraries and recreation rooms. These rooms are now good, suitable, and sufficient for the purpose, though until lately this was not so at the *dépôt* and Forton. There are in every case distinct rooms, one for the library and reading room, and one for games, supplemented by a refreshment bar.

"These institutions are managed by a committee of the men themselves, of course under official supervision.

"A sergeant is in charge as 'secretary of the library' and 'recreation room,' who receives at the *dépôt* an allowance of 9*d.* a day; at Eastney and Gosport, 1*s.*; at Chatham and Plymouth, 6*d.* for the duty.

"The men who use these rooms have to pay a small subscription. At present this is at the depot 2*d.* per month; at Eastney and Gosport, 1*d.* per month; at Chatham and Plymouth,  $\frac{1}{2}$ *d.* per week. There

is also a profit on the sale of refreshments. At some of the billiard tables a small charge is made, and old books are occasionally sold. The Admiralty grant 30*l.* per annum to each place, and a moiety of the fines for drunkenness is also allowed to be given to this fund.

"The expenditure is always kept well within the receipts, and varies in its details according to requirements. Sometimes a number of new books are purchased, or a number of old ones bound; at other times the balance is used to replace a billiard or bagatelle board, or to supply deficient games. A large number of periodicals and newspapers are always on the tables. The books can be taken out not only by the men living in the barrack rooms, but by the married men, whether living in married quarters or out of barracks.

"In Appendix No. 1 is tabulated the average monthly number of subscribers during the year ending 31st December, 1881, with particulars of the receipts at the different divisions.

"The official Returns do not give such particulars as the number of volumes in these libraries, or the number issued to subscribers. At my inspections, however, I have examined the catalogues and the issue records, and formed an opinion on all these points. In Appendix No. 2, I give details obtained at inspection, with the assistance of the librarian in charge, for the half-year ending 31st December, 1875. During that year the total number of volumes issued was as follows:—

Eastney.....	20,800
Walmer.....	13,779
Chatham.....	6,997
Forton .....	6,844
Plymouth.....	5,340
Total.....	53,760

"At the present time, at the depôt they have nearly 2,700 volumes; at Eastney about 4,000, at Chatham about 3,000, at Gosport about 2,000, and at Plymouth about 1,700. The aggregate number of volumes in all the libraries is between 13,000 and 14,000, and of these probably 1,500 are always in the hands of subscribers. Nearly one-half of the men on shore belong to these institutions, and as many as 85 per cent. of the recruits join them while at the depôt. This last fact is exceedingly satisfactory."

## APPENDIX No. 1.

*Marine Libraries and Recreation Rooms for the Year ending  
31st December, 1881.*

Divisions, &c.	Average monthly number of sub- scribers during year.	Amount of subscriptions during year.	Moiety of fines for drunkenness.	Admiralty grant.
		£ s. d.	£ s. d.	£ s. d.
Depôt .....	985	74 8 2	10 17 11½	30 0 0
Eastney .....	800	39 19 11	15 3 2½	30 0 0
Chatham .....	305	30 9 4	18 7 6	30 0 0
Forton .....	541	27 0 11	18 18 9	30 0 0
Plymouth .....	218	17 3 4	12 12 0½	30 0 0
Totals .....	2,849	189 1 8	75 19 5½	150 0 0

## APPENDIX No. 2.

*Marine Libraries and Recreation Rooms for the Half-year ending  
31st December, 1875.*

	Depôt.	Eastney.	Chatham.	Forton.	Plymouth.	Total.
Total number of subscribers on last day of half-year ending 31st December, 1875 .....	918	613	761	262	180	2,734
Number of men on shore at that date who might be sub- scribers .....	1,120	1,570	1,319	878	819	5,706
Percentage of number of sub- scribers on number who might be .....	81·9	39·0	57·7	30·0	22·0	47·9
Average daily attendance in Library and Recreation Room	300	600*	260	125	90	1,375
Percentage of attendance on number of subscribers .....	32·7	97·8	34·2	47·7	50·0	50·3
Number of volumes in Library..	2,637	3,941	2,966	1,893	1,642	13,079
Total number of volumes issued during the half-year .....	7,803	9,100	3,945	2,984	2,576	25,903
Average number of books in the hands of subscribers .....	297	369	188	250	130	1,234

Sec. 3. It will be seen from table, page 522, that the seamen's library is divided into five classes, according as the ship's complement is above 600, 450, 250, and 100, and below respectively. As regards number of volumes, compared with the ship's complement, the small ships are best off, the number of volumes per man being as follows in order: 1.1, 1.3, 2.8, 3.2, 4.6.

The table also shows that the greatest number of volumes are issued in the 4th class, giving proof of the truth of Mr. Grant Wilson's observation that "all the best works, to be useful, should be in the lower classes. The greater number of men in exceptional ships might be met by allowing duplicates of some of the more important works."

The catalogue of the seamen's library should be arranged according to subjects as well as authors, and it would be advantageous if a copy on a board, and varnished, were hung up in a suitable place on board each ship. A copy should also be kept for reference at the Royal Naval College, the Admiralty waiting-room, and the waiting-room at each Commander-in-Chief's office, so that an Officer ordered on foreign service could see at a glance what books he would find within reach, and decide what to provide himself with.

In the catalogues the letter S has been adopted to signify that the work denoted is only to be issued to ships bound to the particular station it refers to.

This appears a very good plan requiring development, as at present there are very few books marked S.

The table on the next page has been prepared with a view of comparing the naval libraries with the free lending library of the town of Liverpool, as detailed in a Return ordered by the House of Commons to be printed in June, 1877. It seems desirable, for the purposes of comparison, that the classification of books by subjects should be uniform, and this list is a tolerably full one.

Liverpool had 493,346 inhabitants in 1871, the Act was adopted in 1852, and the lending library opened in October 1853. It contained at the date of this report 42,035 volumes, and the number of borrowers in the year was 8,965, consisting of people of 274 distinct professions or trades, 2,158 being specified as women.

It must be observed that there is also a reference library of 63,146 volumes at Liverpool.

Though a comparison by percentages is not a very satisfactory way of comparing large and small libraries, the number of works of prose fiction being practically enormous, while the number of standard works is limited, yet it affords some guide, and shows very well the comparative state of the two naval libraries.

I have arranged the subjects according to the total number of volumes issued in each class, to afford some index of the effective demand for books.

It may be observed, that if the best works are to be found in all libraries, the percentages of works under heads 3 to 8 inclusive should be higher in the smaller libraries, whereas in all but head 6 they are considerably lower, and in the case of history and biography

most strikingly so, there being, in fact, only 74 works of this class in the smaller library, while there are 243 in the first class.

*Comparison of Free Liverpool and Naval Libraries.*

Order of popularity by volumes issued.	Classification of books by subjects.	Percentage volumes of each class bear to total number in each library.			
		Liverpool lending library.	Naval 1st class library.	Naval 4th class library.	Royal Naval College, Greenwich.
1	Prose fiction .....	36·7	34·0	40·4	Including all subjects marked L 8·3 20·2 28·4 24·1 12·3 L
2	Miscellaneous magazines, &c. . .	13·5	9·3	14·7	
3	History and biography .....	15·8	29·9	18·4	
4	Science and the arts .....	4·7	5·6	5·1	
5	Voyages and travels .....	7·6	6·1	4·8	
6	Theology and moral philosophy	6·9	6·3	7·0	L
7	Natural philosophy and mathematics .....	2·7	0·5	nil	2·9
8	Natural history .....	2·8	3·0	1·7	0·4
9	Education, languages, logic . . .	2·0	0·3	nil	L
10	Poetry and the drama .....	2·8	3·0	6·0	L
11	Topography and antiquities . . .	1·3	2·0	1·9	2·0
12	Commerce and political economy .....	1·2	nil	nil	L
13	Jurisprudence, politics, &c. ....	0·7	nil	nil	1·4
14	Latin and Greek classics .....	0·5	nil	nil	nil
15	Books for the blind .....	0·8	nil	nil	nil

Mr. Harbord's Report shows that in the harbour ships the libraries are not much used, while at the marine divisions about 48 per cent. of the men subscribe to the libraries. It may be remarked, that in 1879 there were 14,978 married men in the Navy, 28·9 per cent. of the total force being over 30 years of age, and of those over 30, 69·6 per cent. were married.

If we look at the seamen's library as regards number of books, it is on a liberal scale for most ships, but needs revision.

If we look to it for aid to Officers, for the study of those subjects mentioned as desirable in the Minute on the foundation of the Royal Naval College at Greenwich, we find it very deficient, and especially so in the lower classes.

There is no book on botany, geology, or chemistry, in any class. Bacon's and Burke's works, and the history of United States of America, are unrepresented. Of great wars witnessed by the present generation there are no accounts, and hygiene and physiology are unrepresented.



In the 4th class there is no book, even elementary, upon astronomy, no history of Greece or Rome, and the History of England only from 1713-1785, except so far as James's Naval History gives it.

The 4th and 5th classes have no life of Sir F. Drake or Lord Collingwood, and the 5th has no life of the Duke of Wellington among its 277 volumes.

These are merely instances to show the need of present revision, and we may add, the need for provision being made for subsequent revision at stated periods.

The Commissioner of Education of the United States of America, states in his Report for 1881: "The general tendency of persons who continue drawing books from a library has been stated on good authority to be a gradually increasing interest in a more instructive and improving class of books, than that for which they had at first shown a preference."

To develop the full advantage obtainable from libraries, it may be well to remember that in 1870 Admiral Sir Alexander Milne, Bart., G.C.B.,<sup>1</sup> advocated lectures being given afloat by the naval instructors, and the following idea of Mr. Bailey,<sup>2</sup> councillor of Manchester, seems worth recording: "Until we have more reading of useful and refining literature, the full measure of library utility will not be gained." "Hence it seems desirable that lectures on the books contained in the libraries should be established in connection with them; so as to point out those books which would give that general *résumé* of the subject, which every fairly educated person would be anxious to possess, and those useful for special researches."

It appears from Mr. Harbord's Report that lectures, illustrated by magic lantern slides, are given on board the training ships during the winter months, and also to the men and their families at the marine depôt and divisions, and he adds that as a means of conveying instruction and useful information to the recruits, their importance cannot be overrated.

V. By the kindness of the Naval Attachés of foreign Powers, I am enabled to add a short sketch of what is done in other navies.

Commander Baron de Haan, I.A.N., informs me that the Austrian Navy has libraries at Vienna, Trieste, and Fiume, in connection with the naval school, and an Officers' library at Pola, kept up by the Government.

When a ship is ordered on foreign service, she is supplied with books of reference and a selected library for the Officers, selected with a view to the particular voyage. The Austrian seamen are not, I understand, great readers, but prefer illustrated books and papers.

The reference library supplied to all large Austrian ships consists of fifty-three works, of which ten are dictionaries of various kinds. Several are manuals on various subjects; in fact, a work of reference for each subject of interest to Officers is provided. Ortolan's diplomacy of the sea is included.

<sup>1</sup> Answers to questions addressed by Sir C. Shadwell's Committee to fifty-six Officers.

<sup>2</sup> "Proceedings of the Library Association," 1880.

The library at Pola consists of 22,000 volumes, which are added to annually. Naval Officers may borrow books for one month at a time, and are free to express their wishes with regard to the acquisition of books.

At Pola there is a scientific union of naval Officers, where lectures are given and discussed.

The Admiralty publish the subject of prize essays for every branch of the Navy, to be submitted without name, and for which premiums are given.

Such essays are published by the "*Mittheilungen aus dem Gebiete des Seewesens*" (communications to the Admiralty), if not concerned with confidential subjects.

Captain Le Clerc, of the French Navy, informs me that there are no Officers' libraries in the French Navy, but the seamen's library is open to Officers.

A seamen's library is supplied to every ship having a crew exceeding ninety men, in three classes, according to complement. The first class consists of 200 volumes, the second of 190, and the third of 100.

There is a library for the seamen and marines at each naval divisional headquarters consisting of 1,300 works, distributed as follows:—Naval and military science and art, 58; naval and military history and biography, 136; mathematics, geometry, &c., 39; physics, chemistry, natural history, and hygiene, 104; general history and biography, 127; geography and travels, 278; philosophy and religion, 32; commerce and industry, 36; literature, fine arts, classics, magazines, and prose fiction, 418; works of reference, 59; maps and atlases, 13. There is a library for the naval medical profession at Brest, consisting of 15,200 volumes, founded in 1802.

Commander Oldekop, I.G.N., informs me that the Imperial German Navy<sup>1</sup> has central libraries at Kiel and Wilhelmshaven for the ships of each station.

That at Kiel is united as to administration with the library of the naval school, that at Wilhelmshaven with the station library. The selection of new works for purchase rests with a committee, consisting of the Officers administering the libraries and the Protestant chaplain.

The object of the libraries is to provide books of an instructive, entertaining, moral, and religious character, for the use of the Officers and crew.

These libraries are much appreciated, and frequently all the books are in the hands of readers.

The number of books allowed is half as many annually as there are Officers and men on the ships' books, so that if a ship is two years in commission, as many books as there are people on board will have been supplied.

It must be observed that there is at Kiel a university library of 180,000 volumes, which must be an advantage to the navy.

The Italian Navy, as I am kindly informed by Rear-Admiral Noce,

<sup>1</sup> "Instructions on the Organization of the Libraries of the German Navy." Berlin, Oct., 1872. Kindly forwarded by Captain Schelin, I.G.N., Librarian.

has no libraries afloat, except in ships going on foreign service for a long period; they have, however, a library in each dockyard, viz., at Spezia, Naples, and Venice, for naval Officers, and large public libraries exist at Naples, Venice, Messina, and Palermo.

The Russian Navy, as Commander Linden, I.R.N., informs me, has a splendid Officers' library attached to the naval club at Cronstadt, to which all Officers are compulsory subscribers. This library contains thousands of volumes in Russian and nearly all European languages; there is a large reading-room attached to it, furnished with all the leading newspapers, both Russian and foreign, on political, scientific, and professional subjects; the rooms are lighted by electricity, and are much frequented by all naval and military Officers.

When a vessel is commissioned, a sum of money is allowed for the Officers' libraries, and the selection of books is left under certain restrictions to the Officers themselves.

The seamen live in barracks; and as there are no boys' training ships many when they first join cannot read or write. This is taught them during the winter months with other subjects. There are small libraries, both in the barracks and on board ship, for the seamen, containing books on religious and professional subjects, but they are insufficient to satisfy the demand.

The United States Navy, as I am kindly informed by Commander Chadwick, has libraries afloat, which are located in the cabin of the Commanding Officer.

The books are primarily for the use of all the Officers, and are issued to them upon their individual receipts for a specified period, at the expiration of which they have to be returned, or if not required by others may be re-issued upon new receipts.

Books containing historical or miscellaneous reading matter may be issued also, under restrictions, to such of the crew as desire to read them, and give promise that they will take good care of them.

The books are entered on four different lists:—

1. Nautical books.
2. Medical books.
3. Office of Naval Intelligence.
- 4A. Regular library allowance list.
- 4B. Special library allowance list.

On List 1, the books are of the character of those issued from our Hydrographic Office, many being the same. There are three classes of papers whose names are significant, viz., Navy Scientific Papers, Navy Professional Papers, Navy Practical Papers. On List 2 occurs Parke's Hygiène and three professional works.

On List 3 we have eminently suggestive titles in Information from Abroad, War Series, General Information Series. Under the first are entered:—

No. 1. "Operations of the French Navy during the recent war with Tunis," translated from the "*Année Maritime*," by Lieutenant M. F. Wright, U.S.N.

No. 2. "The War on the Pacific Coast of South America between Chili and the Allied Republics of Peru and Bolivia, 1879-81," by Lieutenant Theo. B. M. Mann, U.S.N.

No. 3. "Report of the British Naval and Military Operations in Egypt, 1882," by Lieut.-Commr. C. F. Goodrich, U.S.N.

Under the General Information Series we find :—

No. 1. "Observations upon the Korean Coast, Japanese and Korean Ports, and Siberia, made during a Journey from the Asiatic Station to the United States through Siberia and Europe, June 3rd to September 8th, 1882," by Lieutenant Buckingham, Ensign G. C. Finsk, and W. McLean, U.S.N.

No. 2. "Reports on the Exhibits at the Crystal Palace Electrical Exhibition of 1882," by Ensign F. J. Sprague, U.S.N.

On List 4A is a library catalogue, classified by subjects as follows :—

Bible and Prayer Book.

1. Jurisprudence, 17 works, including two on the Constitution of the United States, and several Acts of Congress.
2. Diplomatic Correspondence, 1861-1866, and continuations, U.S. Consular Regulations, and three other Treaties, &c.
3. Naval and Military, 14 works, principally technical.
4. Steam, 5 works.
5. Language, 3 dictionaries.
6. History and biography, 32 works, including 12 of American Statesman Series.
7. Geographical, 4, including 1 Atlas.
8. Miscellaneous, 32 works, including 3 Encyclopædias, 1 Dictionary, the Journals of the R.U.S. Institution and United States Naval Institute.

Under history, "Bancroft's History of the United States," 10 volumes, are supplied, and "Civil War in America," by the Comte de Paris.

List 4B consists of 59 works on various subjects, unclassified, among which is a "Life of Lord Collingwood," which is not in our own libraries.

From the foregoing survey of our libraries certain questions emerge which I will endeavour to summarize for discussion :—

1. Should not the acquisition or recommendation of books for naval libraries be vested in a permanent Committee under the President of the Royal Naval College at Greenwich ?

2. Should not branch Committees sit occasionally at the home ports, on which petty officers should be represented ?

3. Should not the President of the Royal Naval College be empowered to spend a certain sum annually in the acquisition of old works which come into the market at uncertain periods, so as gradually to provide the library with all standard works ?

4. Would it not be advantageous if reference or lending libraries were established on shore at each of the home ports ? Perhaps the more important works now in the libraries afloat at Portsmouth and Plymouth might be transferred to them with advantage.

When our present Chairman was Commander-in-Chief at Portsmouth, the large library at the old Royal Naval College was fitted up for books and some lectures given there. Unfortunately the shelves remain empty, as no money could be granted.<sup>1</sup>

At Devonport there is, I understand, no suitable building, but when barracks are built we must hope there will be.

5. Turning to libraries afloat, are not reference libraries for Officers much needed, more especially with regard to previous voyages to the station a ship goes to for her commission?

This is a want which can scarcely be met by individual exertions, as copies of many voyages are not to be had at any price, and some are very scarce. Is it not desirable that a manual should be drawn up for each of our seven distant stations, giving a short account of the more important early voyages to them, with a list of works containing further information, and whether they are at the Admiralty, War Office, or Greenwich Royal Naval College library?

A remark of Admiral Burney, F.R.S., in his preface to his chronological history of the discoveries in the South Seas from the earliest times until 1723, published 1803 to 1816, seems to advocate this. He wrote: "A third method which appears to possess many, if not the greatest advantages, is that of classing the voyages according to some hydrographical division of the globe."

Commander Hubert Grenfell, R.N., remarks: "When a man goes to a station for the first time he is often as ignorant of it as a child. His predecessors have traversed these waters for centuries, but all the valuable knowledge acquired is for the most part either buried with them, or buried at Whitehall. In the German Navy it is the practice to instruct the young Officers and seamen in the history, peculiarities, &c., of the places they visit; and I should like to give our Officers the chance of learning more about the places they often stay so long in and know so little about; that is the object for which I should select the books. With a little arrangement it seems to me that a very useful amount of information, and even a pleasant source of amusement, might be made available for everybody."

"On most stations there are certain well-beaten tracks. At present you start off on the old round, absolutely ignorant of all your predecessors have done, or of the stores of information they have acquired, and, painfully, in the end you hammer out the same knowledge for yourself—to be equally lost, as far as general benefit is concerned. This is a great pity. Suppose when you leave for a two months' cruise round the Bahamas or down to the Honduras coast, you received from the Commodore's office a big record book containing an abstract of passages made—wind, weather, storms, and gales encountered, &c., selections made at the discretion of the Commodore from official reports of proceedings relating to that particular round. Would not that be a very highly useful book to have with you, giving in close detail the special information you want for the time being? Then, in addition, if you got another similar record book containing

<sup>1</sup> There is a first class seamen's library at the Naval College.

notes of places visited—fishing, shooting, &c., to be had, food to be obtained, and prices paid, excursions, places of interest, hints of all kinds, adventures, and yarns if you like, to which you and your Officers could add your quatum of grave or gay, it seems to me there would be no readier vehicle for enabling you to pass your time profitably as well as pleasantly. The books, when you got back, to be returned to the Commodore's office and handed to your successors.

"As to the usefulness of a reference library at a place like Portsmouth, there can be no question; I hope, if established, the benefit may extend to retired as well as active Officers.

"Much useful work might be done with the microscope by any one with tastes in that direction, and I would hazard a suggestion that a direct incentive be given to study on the part of Officers who are naturally inclined to such work."

6. Should not flagships on foreign stations be supplied when possible with a copy of the accounts of important previous voyages to their respective stations, and also with Consular reports referring to their stations, and important Reports of Committees? The number of Her Majesty's Consuls on each naval station is as follows:—Australian station, 2; south-east coast of America, 7; Cape of Good Hope, &c., 6; China, 18; East Indies, 6; Mediterranean, 32; North America and West Indies, 15.

These reports contain accounts of the movements of British shipping and other matters of importance affecting British trade.

The "Stateman's Year-book," and the Foreign Office, Colonial Office, and Army Lists, are almost necessary abroad; they can be purchased, but Commanders-in-Chief and Senior Officers of stations might perhaps be furnished with them.

7. Is it desirable that the libraries for small vessels should be made up in sections, to allow of an annual interchange taking place?

8. To conclude this division of my subject,—Do not the works at present supplied to Commanding Officers form a suitable nucleus for the suggested reference library afloat?

A glance at the publishers' catalogue for 1880 shows that by the combined exertions of authors and publishers, a great number of valuable works on biography, history, and science may be had at a very cheap rate. As instances I may mention Mr. Bohn's 3s. 6d. and Mr. John Morley's libraries, 2s. 6d., the International Scientific Series, 5s. to 6s., Murray's Home and Colonial Library, 2s. to 3s. 6d., Nature Series, 2s. 6d. to 4s. 6d., Macmillan's Scientific Class Books, about 4s. 6d., and many others, notably Science primers, 1s. each.

Purchasers on a large scale may count upon a reduction of 25 per cent. on published prices. Captain Montagu Burrows, R.N., Professor of Modern History at Oxford, has kindly pointed out the names of some valuable works on history which are absent from our libraries afloat. I may instance "Green's History of the English People," 4 vols. 8vo.; "Hallam's Middle Ages and Constitutional History," 6 vols.; "Dyer's Modern Europe," 1453 to 1852, 4 vols. 8vo.; "Rimbaud's History of Russia," 2 vols. 8vo.; "Sir James Stephen's Lectures on the History of France," 2 vols. 8vo.; "Mommson's His-



tory of Rome," translated by Dickson, 4 vols. 8vo., and numerous others. Mr. F. B. Perkin's "Treatise on the Best Reading and Hints on Selection of Books," &c., revised to August, 1876, published at New York, may be mentioned as a very useful assistant in revision.

VII. As a means of diffusing information this Institution is one of the most prominent. It does not, however, meet with as much support as might be expected considering the advantages it offers, and the fact that it is handsomely subsidized by the Admiralty and War Office.

Among those advantages the valuable professional library of nearly 21,000 volumes and the Journal may be mentioned as conspicuous.<sup>1</sup>

This Institution was founded in 1831 under the patronage of His Majesty King William IV and the Duke of Wellington. The Navy Estimates of 1884 show 3,477 commissioned Officers of the Navy and marines, which with 368 Officers of reserves, gives a total of 3,845, of which 423, or 11 per cent., belong to this Institution. Of Commanders and higher rank inclusive 240, or 42 per cent., belong. Of Lieutenants and Sub-Lieutenants 159, or about 15 per cent., belong. Only 41 civilian naval Officers, active and retired, belong. There are 264 retired naval Officers belonging to the Institution.

The Army Estimates show 7,243 Officers on Home and 2,487 on Indian service. There are 4,219 Officers of militia, and 8,287 Officers of volunteers, making a total of eligible military members of 22,236, of whom 3,940, or 17·7 per cent., belong.

We must remember that there is a Royal Artillery Institution; a Royal Engineers Institution, and an Indian United Service Institution, to compete with this in the case of military Officers, and were the large number of militia and volunteer Officers abstracted, the percentage of members to total force would probably be much higher.

The need for a Royal Artillery Institution was felt in the last century; it was founded in 1838, and now has 1,530 members. It is self-supporting. I am enabled by the kindness of Major Hime, the Secretary, to state that its library contains 4,000 volumes on scientific subjects. Besides this the Royal Artillery have a library of 26,000 volumes at Woolwich, which is now being catalogued afresh.

A glance at the Proceedings of the Royal Artillery Institution for 1881 shows that 83 papers were printed, but no discussions. A few of these papers involve mathematical treatment of a highly scientific character, but the majority are perhaps best described as of a purely technical character.

The Secretary is appealed to by Officers absent from Woolwich on an infinite variety of subjects, and books may be procured through him. This is found very useful to the profession.

I owe the following account of the Royal Engineers' Institute and Corps libraries to the kindness of Captain Day, R.E., Secretary to the Institute.

<sup>1</sup> The Journal is now supplied to the libraries of all ships in commission—Ed.

The Professional Papers of the Royal Engineers were started in 1837, and are published annually; they contain articles of more lasting interest than the Journal, which is a semi-official monthly publication, was started in 1871, and deals with all matters of passing interest.

The Institute, which was started in 1875, may be said to be a consolidation of all previous individual efforts to increase the professional knowledge of the corps; the before-mentioned publications are edited by the Secretary, and supplied free to all members.

The Institute is practically self-supporting, but the Secretary and head clerk receive Staff pay.

The Corps libraries<sup>1</sup> of the Royal Engineers seem especially worthy of our attention. "Their object is to enable Officers, whether serving at home or on foreign stations, to refer to the works of the best authorities on any of the multifarious duties they may be called upon to perform, such works being of necessity more numerous and more expensive than an Officer can be expected to possess or to carry with him."

There are fifteen of these libraries at home and fourteen in British possessions abroad, that at Chatham contains 4,000 volumes.

The War Office library in London is the headquarters and central library; it is also the only one which contains other than strictly professional works. Any Officer in the United Kingdom can obtain books from the library free of charge, for working up any subject, professional or otherwise.

The selection and ordering of books for the Corps libraries is vested solely in the Committee of the Royal Engineers' Institute, but the Officer Commanding Royal Engineers at each station is requested to forward to the Secretary on January 21st annually a list of such books as he and the Officers under his command think most applicable to the wants of his station. The Royal Engineers' Institute<sup>2</sup> has been established for the dissemination of professional information to the Officers of the Corps of Royal Engineers, and for scientific and educational purposes. It is managed by a committee, His Royal Highness the Field-Marshal Commanding-in-Chief being the Patron and President.

If we look beyond the naval and military services we find no profession of any importance which has not its library and institute, and it may fairly be said that such things are a recognized necessity of the age we live in.

An analysis of the lectures and papers contained in the Journal of the Royal United Service Institution during the ten years ending May, 1882, shows that 200 lectures on subjects of direct professional interest to naval Officers have been given, and 20 notices of books and occasional papers contributed. 255 lectures on military subjects have been given, and 47 notices and occasional papers contributed.

Of the above naval papers it is noteworthy that twenty were on

<sup>1</sup> Rules of the Royal Engineer Corps Libraries, revised 8th June, 1881.

<sup>2</sup> Rules of the Royal Engineer Institute, revised July, 1881.

naval tactics, a subject entirely unrepresented anywhere else, though unquestionably of paramount importance both as regards the construction and handling of ships and fleets.

This brief review of what is done elsewhere, and the opinions received from Officers consulted, notably Rear-Admiral Curme and Captains Fremantle and Codrington, appear to point clearly to the conclusion that the Navy is somewhat behindhand in the department of diffusion of information.

That it is so cannot be wondered at, when we recollect that until the establishment of the Royal Naval College at Greenwich in 1873 there was no headquarters to which Officers would naturally look.

Now, however, that a permanent centre is established, the efforts of all should be directed to developing and distributing as much as possible the great advantages it was designed to confer upon the Service.

A profession may be compared to a wave, the form passes on, but the members composing it are constantly changing, and it must be the object of each generation that their successors may stand, as it were, intellectually on their shoulders, beginning where they leave off.

Now the establishment of a Royal Naval Institution at Greenwich on the lines of the Royal Engineer and Royal Artillery Institutions, as advocated by Captain Codrington, C.B., would be a decided step in the right direction, and if Officers' libraries similar to those of the Royal Engineers were included in the scheme, and the details well worked out, it is difficult to estimate its possible value to the Service. Such an institution should be open to every Officer of commissioned rank in the Navy as members, and Officers of the reserve naval forces, and members of the Institution of Naval Architects, should be eligible as associates.

If the Admiralty found the buildings, we could surely do as much as is done in other professions, and find books and printing.

At Greenwich no building would be necessary, nor at Portsmouth, where one exists, and the accommodation required at other ports might be added to the barracks.

Some Officers doubt the value of discussion, but while the reporting or printing of discussions is generally undesirable, except where they are discussions on novel points by Officers of experience, and such might well be confined to the Royal United Service Institution, yet as a means of obtaining clear views of any question, and stimulating inquiry, they are valuable, and we may quote King Solomon's proverb<sup>1</sup>—"Iron sharpeneth iron; so a man sharpeneth the countenance of his friend."

However, the principal value of such an institution would undoubtedly be the papers contributed, and the affiliated libraries.

As regards the papers, a good editor is the life of such an institution, and to be a good linguist must be of paramount importance. In the dispatches of Ministers published in the "*Revue Maritime*" we

<sup>1</sup> Proverbs, xxvii, 17.

find that increasing importance is attached to the insertion therein of all records of progress in the arts of war published in foreign contemporary journals. Officers holding appointments at home have to submit biennially an essay on some naval subject, which are reported upon by a Committee, and either published in the review, or copied for distribution to the home ports, if expedient.

Rear-Admiral Noce, R.I.N., informs me that an annual series of lectures on the discoveries and improvements of the year, in the arts of naval warfare, are given to young Officers of the Italian Navy, and occasionally the Minister of Marine proposes a subject to be written upon by Officers below flag rank.

Captain Linden, of the Imperial Russian Navy, informs me that lectures to Officers are given during winter in the hall of the Naval Club at Cronstadt of a more or less popular character, of which the following for 1884 may be taken as a sample:—

“On New Discoveries in Astronomy,” by Professor Glasenap, of St. Petersburg University. Two lectures.

“On the Strategic Bearing and Organization of Fortresses,” by Colonel Eremeff. Two lectures.

“On Naval Operations in Chinese War with European Powers,” by Captain Mertwags.

“On the Vienna Electrical Exhibition,” by Lieutenant Iweritinoff. One lecture, with demonstrations.

“On the Hygiene of Ordinary Life,” by Dr. Slunin. One lecture.

“On the Parasite Theory as to the Origin of Diseases,” by Dr. Perfilieff. One lecture.

“On the Deviation of Compasses, and the Means for its Correction,” by Captain De Kolong. Six lectures.

The torpedo and artillery classes have their own lectures.

Besides the above, there are regular gatherings at Cronstadt and St. Petersburg for playing Captain Colomb's Naval War Game, under the presidency of some experienced Officer as umpire, the game and its scope being much enlarged by the new scales, worked out some time ago by Captains Grundstrem, Valitsky, and others. These scales are found to save time, and facilitate the registration of the fighting ships.

During winter entertaining lectures are occasionally given to seamen in a large hall called the *Manège*, which will accommodate 2,000 men.

This hall is fitted up for drills and is artificially warmed, as the winter climate is too rigorous to allow of outdoor exercises. Lectures on elementary physiology are also given by a surgeon to the class of divers.

It has been said that until naval Officers are called upon to superintend the construction of their own guns, a professional institute of the kind advocated is unnecessary.

Gunnery is, however, only one branch of naval science, and there are numerous other subjects of parallel importance; probably what may be called the technical papers would be most numerous and useful, though occasionally we might hope for some displaying ori-

ginal scientific research. It is a question whether benefit would not result from the printing of some of the lectures now delivered at the Royal Naval College annually.

I find in the Report of Mr. Osborne Gordon's Committee, 1877, page 49: "We think there are many subjects connected with the naval profession on which it may be desirable to give information to Officers in the form of lectures, but that while they cannot all be embodied in the course of one session, the particular subjects selected will vary from year to year."

Again, page 50: "We notice that in the original scheme for the foundation of the College, lectures were contemplated in geology and mineralogy, natural history and botany, hygiene, naval and climatic, &c.<sup>1</sup> Scientific investigation and practical experience are constantly arriving at results of great value, which it may be of importance to Officers to become acquainted with, though they may not have studied the particular department of knowledge to which they belong."

Surely if such knowledge is of professional value, the great body of Officers serving afloat ought to be considered equally with the small number who happen to be present at a lecture.

Considering the importance attached to a knowledge of military history by such great commanders as Frederick the Great of Prussia, Napoleon I of France, and our own Admiral Lord Collingwood, it must be admitted to be a subject of the highest importance to Officers in command. Our naval libraries are, however, singularly deficient in works on naval history and biography. By the death of Sir Harris Nicolas,<sup>2</sup> when his history had only reached the year 1422, the Navy suffered a great loss, but surely the Royal Naval College should have a professor of naval history untrammelled with any other duties but those of writing history from papers contemporary with the events described, and giving a certain number of lectures annually before the College, which should be printed for general circulation, on the principle that "the words of the wise are as goads" where stimulus is needed.

Naval tactics were included in the original curriculum of study, and if it be not desirable that they should be taught officially even to young Officers, surely occasional lectures would be valuable, and on the basis of the Manual of Manœuvres, supplemented by careful definitions, progress in the formation of sound opinions would doubtless be made. Were such an institution established there would doubtless be frequent contributions from reports of Officers abroad of general interest, and sometimes matter in the reports of Naval Attachés which it might be expedient to publish.

If it be asked, how is such an institution to be started? We can only reply England is conspicuous for the success of private enterprise, and the sanction and even assistance of our rulers might doubtless be obtained for a scheme of a sound and general character having the interest of the Service impressed upon it.

<sup>1</sup> Admiralty Minute 17/1/1873 on formation of Royal Naval College.

<sup>2</sup> "Naval History of Great Britain." Sir H. Nicolas.

One day's pay of the commissioned executive branch of the Service alone, on full and half-pay, would yield an annual sum of 1,132*l.*, and the estimates show that if Officers were willing to act together, there would be no great financial difficulties. May not the question, then, be with propriety laid before the profession—Should not a Royal Naval Institution, under the patronage and control of the Lords Commissioners of the Admiralty, be founded in connection with the Royal Naval College at Greenwich, and should not Officers be invited to contribute towards the foundation of Officers' libraries at the home ports, and ultimately for the publication of a monthly journal, which should be distributed free to all subscribers?

Such an institution I hope and believe would not affect the Royal United Service Institution, which is equally necessary, and holds a position which cannot be filled by any special institute of the kind advocated.

There are numerous subjects of great interest to naval Officers, which are primarily soldiers' questions, and some also which are best discussed in company by members of both Services.

Again, the library of the Royal United Service Institution is invaluable and most conveniently situated, in fact it appears more probable that a Royal Naval Institution at Greenwich would ultimately be the means of inducing many who now are not members of this Institution to become so.

In conclusion, then, it appears that the best means of diffusing information among the Officers of Her Majesty's Navy would be a Royal Naval Institute at Greenwich, with affiliated libraries at the home ports, and the provision of reference libraries afloat; and as regards the seamen, the revision of existing libraries, greater facilities for their use at the home ports, and the encouragement of lectures on various subjects based on their contents.

The following works have been consulted besides those quoted:—"Bacon's Advancement of Learning;" Bohn, 1860. "Locke on Education," edited by Rev. R. N. Quick, M.A., Cambridge University Press. "Lectures on Teaching," delivered at the University of Cambridge in 1880, by J. G. Fitch, M.A., one of Her Majesty's Inspectors of Schools. "Education and Educators," by David Kay, F.R.G.S., London, 1883. "Introduction to the Literature of Europe in the 15th, 16th, and 17th Centuries," by Henry Hallam, LL.D., F.R.A.S., 5th edition; John Murray, 1855. Also papers in the Journal of the Royal United Service Institution, by Captain J. G. Goodenough, R.N., Admiral A. P. Ryder, and Professor J. K. Laughton, M.A., R.N.

Captain the Hon. E. FREMANTLE, R.N.: I think we must all have been struck by the great pains taken by Captain Long in getting up this lecture. It is a very large and varied subject, and I think it has been treated very worthily. There is a great deal in the tables which most of us or many of us have had the pleasure of seeing in the printed issue of the lecture, and they offer a great deal which is well worth attention. I am rather sorry, however, that Captain Long did not explain them a little more fully, because I am afraid some people who have not read the lecture will not have had time to master them. I think the suggestions made by Captain Long meet entirely the views that I have formed on this subject. I am quite sure we ought to have a naval institution, one that deals with professional



subjects. Such an institution has been established by the Artillery and the Engineers, and the only thing required in the Navy to have had it established a long time ago was a central place, and that central place I trust we have found in Greenwich. It will, of course, need a good deal of working out in detail. One subject which has been specially referred to, that of naval tactics, is certainly one to which I have given considerable attention, and which I do not think has yet been sufficiently studied. Naval history is also very insufficiently studied. It has always struck me as strange that the military make so much of the histories of previous wars, and that it forms part of their examination papers, and yet in the Navy it appears to be a thing which is left to be understood by the instincts of nature. There are certainly some admirable naval histories issued to Her Majesty's ships, but a great many Officers never read histories, and a great many have very vague ideas as to what the possibilities are of the conduct of an action. I know this more especially because the public has a vague idea, and this is due very much to those historians, or rather novelists, who write on the great naval deeds of our ancestors, and who naturally have exaggerated what is possible. I think if people had not those crude ideas, we should certainly see more done towards placing our Navy in an efficient state. That, however, I think is a little foreign to the subject in hand. I really have very little to say except that I entirely approve of most of the suggestions contained in this admirable lecture, and truly wish I could shed more light upon it. I hope that those who speak hereafter will be able to add something to the pile of information which has been so well raised up by Captain Long. May I be allowed to mention that my idea, and I think it was the idea of the lecturer, was that Greenwich should be a centre for a library and an institution, but I certainly did not myself propose that lectures should be held there; the lectures should rather be held at the seaports?

Admiral Boys: I had no intention of joining in this discussion, but as our Chairman has called on me by name, I have just two remarks to make. One is with regard to a paragraph in Captain Long's paper in which he appears to say that the naval training of Officers was entirely neglected from 1837 until the College was re-established at Greenwich in 1873. That is not quite the case, nor can such an inference be drawn when we see such Officers as our gallant Chairman, Sir Astley Cooper Key, Admiral Shadwell, and many others of great intelligence and high attainments, who certainly received some amount of their training at the College at Portsmouth as it existed from 1837 till removed to Greenwich; and although the old College could not be compared to the new one, it had certain advantages for the Service about which there could be no difference of opinion. Now with regard to the proposed Institute, I like the idea, but although I am afraid I may throw cold water upon it, I must say I do not think Greenwich would be the best place for it, and for this reason: although there is certainly a large collection of Naval Officers attached to Greenwich, they are all there for a special purpose, studying. Most of them are working at high pressure, and scarcely find time for the necessary recreation to keep them in health; the younger members would certainly not have leisure to avail themselves of the benefits of the Naval Institute, they are too much occupied in preparing for examinations. My view is that it must either be in London or at Portsmouth. It strikes me that while they are building a new Admiralty in London, it would be just as well to devote a part of the building to a new Naval Institute; but as this is, I am afraid, not possible, as we have such a large number of Officers on half pay and full pay living at and near Portsmouth, which is the headquarters of the Navy, I think such an institution would be better supported there than elsewhere.

Commander DAWSON, R.N.: I would venture to suggest with regard to naval libraries, that the further you get from London the more valuable these libraries become. I do not know what is the use to Naval Officers of the 25,000 volumes in the Admiralty: no doubt they are very valuable to a few high officials, but I question whether many Naval Officers study those books; whereas if those 25,000 were distributed over the seven foreign stations they would be very closely studied, and therefore I go fully with any attempt to convey to men serving afloat the means of self-instruction. During the eleven years I was on full pay, afloat in connection with the Gunnery department, I never had the opportunity of acquiring

any information from books on collateral subjects, except the one book that I had to purchase myself when receiving the munificent pay of 65*l.* a year, out of which I bought Howard Douglas's "Naval Gunnery," and that was the only book I had bearing on professional subjects during those eleven years. Nor was I furnished with any information as to current professional events, inventions, opinions, or experiments. I was supposed during five years of that time to be preparing gunnery instructors for the fleet, and yet there were no means supplied for helping me abreast with the subject of guns and gunpowder, of naval tactics, or naval history, so as to equip my own mind for imparting instruction to these embryo instructors. A messmate had got hold of Dahlgren's "Shells and Shell Guns," which I eagerly read. It was like setting the blind to lead the blind, to expect intelligent teaching from an Officer under such conditions. It was not until I came on shore, and had left my instructing work afloat, and came to this Institution, of which I had no knowledge when I was afloat, and found the excellent library here, that I then became acquainted with correct professional secrets and with the more scientific part of the profession, which I had been practising and teaching during so much of my life. What applies to Gunnery Officers applies to all other branches of science with which officers have to deal. Officers should have the means when afloat, when they have leisure, and they have more leisure when they are in distant parts of the world, than when they are nearer home; they should then, when abroad, have the opportunity of professional self-culture. I remember when I was at Devonport, about 1858, the Admiralty sent down an immense boiler which was said to contain  $1\frac{1}{2}$  tons of gunpowder, which we were to explode upon the Vanguard Rock. What a valuable thing it would have been then to have had some books of reference. We were told that the boiler was to be exploded by electricity, but were not supplied with any exact information. We got an electrical machine of the period. We found there was a platinum fuse inside. We went to Sir William Snow Harris, the great electrician, and he said, "It is quite impossible for you to explode it unless you have some information with regard to the fuse inside." We then went to our friends the Royal Engineers, and got a copy of their "Professional Transactions," which told us how General Pasley blew up the "Royal George," at Spithead fifty years ago, and from that we managed to deduce some idea of what was to be done. Naval men have great necessity for information on all kinds of subjects readily available, because they may suddenly be called upon to perform duties for which they have had no previous training. Then Officers on board ship greatly want opportunities of circulating exact professional information as to current events. A splendid act of seamanship is, for example, performed in the China seas. A man serving in the Pacific never hears of it. It certainly would be a great benefit to the Service that every Officer serving afloat should know how such works or experiments were carried out. For instance, look at the wonderful story of the recovery of H.M. Steam Frigate "Gorgon," told by Admiral Key, in that intensely interesting book of his. Professional books of that kind are studied with the greatest interest, and they give high ideas about our profession which we never would otherwise gain. The other day a German ironclad rammed another ironclad ship, and came into Portsmouth for repairs. What a great benefit it would have been to Naval Officers to have had exact information circulated on board ship as to what injuries were sustained by the rammer, and what steps should be taken to prevent other rammers sustaining like damages again. There are hundreds of technical subjects, information on which is annually "buried at Whitehall," as in a sort of professional cemetery, where it is of no use to the profession, and which would be invaluable to Officers if it were circulated throughout the Navy. It would be a good thing if we could have reports of these various professional events printed, circulated, and sent afloat. There are a great many papers on various interesting subjects printed already, but they are not sent afloat, such as experiments with weapons of war, with various classes of machinery and ships, which Officers afloat never get an opportunity of making themselves acquainted with. Officers are kept in a state of ignorance of what is going on in the profession in all parts of the world, and I am sure that this ignorance is a great loss to the public service, a loss which only wants to be reflected upon to be evident to any Officer of experience. A good deal might be done at a comparatively small expense to make Officers' libraries

afloat far more useful than they are. The question of the Institute at Greenwich is a large one, and I must leave that to the next generation to look after, but I really think a great deal might be effected by improving the Officers' libraries afloat by giving them books of reference, and by supplying them with those reports and papers that are already printed, and which might be circulated more widely. I hope the seamen's libraries are really in circulation. I can remember the day when the books were very carefully nailed up in their cases and kept in the hold; and one of the first things I did when I became a Commissioned Officer, was to take charge of the seamen's library in order that seamen might have the use of the books intended for them. I hope that now the seamen's libraries are really available for the crews, without some special person taking peculiar interest in contending for the rights of the men in this respect.

Captain CURTIS: I should like to ask if 80,576 are the whole number of volumes issued to the Navy afloat? because if so there are 15,000 men afloat, and it would be a very small percentage for them. With reference to what Captain Dawson has just said, I think an encyclopædia would cover a great deal of general knowledge. The class books, science class books, and "Science Popularly Explained," published by Cassell, Petter, and Galpin, also a book of natural history, might be issued with advantage on board ship, so that men of the simplest minds could understand them, and men might improve their minds and educate themselves. I do not know whether it is the custom now on board ship to have a general track chart on the main deck. It would be a good thing to put it up near where the station bill would be, with a handrail so that the men could not deface the chart; and by looking at it every day they would learn a deal of geography, and possibly there might be a better look-out kept, because they would know pretty well where rocks might be expected. I think that the Consuls' Reports of the various countries where ships are stationed should be issued to the libraries of the ships on those stations. Captain Long did not explain to us, but I rather think when I was afloat there was an interchange of books of fiction between different ships—not standard works. Perhaps Captain Long will tell us whether they do change books now, because if they do, then a smaller number of books will go much further. I should also like to know if "Dibdin's Songs" are issued in the seamen's libraries. They are very popular, and would be a very good class of song book to put on board.<sup>1</sup>

Lord Henry SKYMOUR: May I ask who is charged with the selection of books for the use of the Navy?

Captain C. JOHNSTONE, R.N.: Our lecturer tells us that there is a library at the Admiralty which may be consulted by the Officers of the Navy. I think this will be news to many of them, it certainly is to me. I do not know where it is, and I expect there are a great many other Naval Officers in the same position as myself. I should like to know whether those books can be obtained by Officers away from London, or whether they must be consulted at the Admiralty; but as from private reasons a very small proportion of Naval Officers are able to live in London, it would of course be of the greatest possible advantage to them if they could obtain those books as our lecturer says is the case with regard to the War Office Library. But I wish more especially to speak about the present state of our libraries on board ship. It must have struck a great many Naval Officers that, although the Admiralty steadily adhere to the name "Seamen's Library," the library contains a great many books obviously not intended for the seamen. "White's Naval Architecture," for example, it is pretty clear, would not be read on the lower deck. I believe the First Sea Lord announced the other day that it was intended to supply the "Journal" of this Institution to the seamen's library. I think it is quite evident

<sup>1</sup> I am strongly of opinion that the little book entitled "Stability, the Seamen's Safeguard," and also a letter, "Why Ships Capsize," published by E. Spon, 16, Charing Cross, S.W., both written by Admiral Fishbourne, should be in the library of every ship, it would enlighten our Officers and men's minds considerably. They know the practical result of a wave breaking over and striking a ship on the broadside, and soon we should have some state in our theatre why ships now go down bottom up.

that that is not intended for the lower deck, therefore I look upon it that the library is not a seamen's library, but is intended to be a ship's library, and it would be better to know it by that name. Considering the number of good books there are in it, I think it forms a very excellent nucleus for a library. When it is desired that grown-up men should educate themselves by reading, it is quite evident you must put before them books that interest them, or they will not read them. By looking at the state of the seamen's library you can tell pretty well what are the books that do interest them. At the end of the commission it is very evident from their appearance which books are popular and which are not. If, with my eyes shut, the names of the books were read over to me, the chances are I could tell you exactly what the condition of each book was. Light books, books of fiction such as the works of Dickens, and so on, all come to pieces before the commission is out; but if you take Macaulay's "History," or such works, you will find that they are intact, like new books. I think, to put it in a practical way, if the Admiralty would supply better books for the use of the Officers, there might be a library committee on board the ship who would look after them, and there would be no danger of their being injured on the lower deck. It would not be necessary to supply the same books to every ship. I think the Captain (or, if preferred, a committee of the Officers) might be allowed to draw books from a dépôt; or ships might be credited on commission with a certain sum of money, as in the case of Officers' mess traps, and the Captain or committee should apply for certain books up to that value, and those should be supplied to the ship. There certainly is in all ships a very great dearth of books interesting with regard to the station on which the ship is. The ship may be suddenly ordered to some new part of the station, and it may happen that nobody on board knows anything at all about the place. It may be a perfectly unknown land to them. The ship may stop on that station for three months or more, and at the end of that time go away, her people having had no access to any libraries. They ultimately come across all sorts of books in libraries on shore, and then they are able to read up what they ought to have read whilst on the spot. I think that books dealing especially with the station might with propriety be supplied to ships. At present throughout the whole of the Navy you find the same books. Every ship with a first-class library has identically the same books. If it is a ship with a second-class library, you find, not a different set of books—you find the same list, but the best or the most expensive works are cut out of it. You then go into a smaller ship, and you find almost all the good books are taken out. For instance, a first-class ship has perhaps "Macaulay's History and Essays;" a second-class ship has the "Essays" alone; but a third-class has neither of them. The last class is allowed all the novels, but all the really good works are taken away. Another reason why good books should be supplied to the Navy, is that Officers cannot take many or large books to sea with them. The cabins are small, and there is not much room to stow books. Also the packing and carriage of books are expensive, and as you may have to leave your ship at any time during the commission, you cannot go about with chests of books. I may also notice that it is unusual to find a book-shelf on board a ship, except perhaps in the Captain's cabin of a large vessel, that will take a large work. I think at least in every squadron there ought to be books of reference that the Officers could get at, so that they may not be wholly dependent upon libraries on shore. There ought to be a good English dictionary, such as the "Imperial," which is in two or three large volumes, and such books as "Littre's French Dictionary," and standard dictionaries in the principal European languages. There ought also to be a good "Encyclopædia." I do not say all the ships ought to have each of these particular works, but every ship ought to have, more or less, works of reference, and the important works I have alluded to should be on the station in some ship or another, so that they could be got at. Why cannot ships' libraries be made interchangeable? It has been suggested that they should be made interchangeable by sections. I do not think that is a good principle, because a book might be withdrawn from a ship where one person was studying it and taken to another ship where it was not wanted, simply that it might go with the section. The Captain or the library committee might be responsible that the general character of the library was not changed. Books might be exchanged from ship to ship by supply note and receipt, and the Captains of both ships and the committees

would be responsible that the general character was not altered, that is to say, that the novels were not exchanged against dictionaries or more important literary works. Of course there are many details that cannot be entered into now, but it is clear that they can be easily arranged. I think that some change of that sort is necessary, and I hope it may be carried out. I am sure we are very much indebted to our lecturer for introducing this important subject.

Rev. J. HARBORD: Perhaps I may be expected, as I have been referred to by Captain Long, to say a few words about the seamen's library. In my opinion the seamen are very well supplied with books, and the only question is one of detail as to how to make the libraries most useful. One important suggestion has been mentioned, and with respect to it I may say that my own opinion is that the advantage of having sectional libraries far outweighs the practical difficulty of carrying the plan into effect. The two questions again of seamen's libraries and Officers' libraries are very much united. Captain Long has given us a very interesting short sketch of the history of the ship's library. It would have been more interesting had it been fuller.<sup>1</sup> In one paragraph of my Report I mentioned the fact that

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<sup>1</sup> The seamen's library originated in the tracts and religious books distributed on board our ships of war through the agency of the chaplains. The earliest reference I have met with to this custom is in a manuscript in the possession of Captain Charles S. Cardall, R.N. It is the diary of the Rev. Thomas Pocock, Chaplain of H.M.S. "Ranelagh," in 1704, and subsequently one of my predecessors at Greenwich Hospital. A few days after joining the ship at Spithead we have the entry, under date 16th April, which was Easter Sunday, "I distributed about 500 books among the ship's crew;" and again, on the 20th, "I wrote to Dr. Manningham for some more pious treatises." On the 9th May, the ship being then off Dunozé, there is this entry, "The Captain and I went to Portsmouth to take the oaths. 'I received some pious treatises from Dr. Manningham.'" Before regular libraries, however, were introduced on board ships, they were established in the Coast Guard, then under the Customs. Full information may be obtained respecting this important step from the "Report of the Committee acting under the sanction of His Majesty's Government for Furnishing the Coast Guard of the United Kingdom with Libraries of Religious and Instructive Books, &c." Published 4th June, 1836. The Committee gratefully acknowledged that the first idea of furnishing these libraries suggested itself to the benevolent mind of Mrs. Fry, who having previously succeeded in inducing His Majesty's Government to establish libraries for the use of the patients in the naval hospitals, was induced by the observations she had made on the subject to endeavour to extend the same beneficial measure to the coast guard service. Various religious societies largely contributed towards carrying the scheme into effect. When the Admiralty decided to introduce seamen's libraries, they consulted the Customs upon the subject, and had the above Report and the continued catalogues of books of "moral and religious instruction" before them. The result was a Memorandum dated 2nd July, 1838, establishing a seamen's library and sanctioning a catalogue. This first catalogue contained only 70 different works, of which upwards of 40 were of a religious character, some of those on secular subjects being simply school books. For it may be remarked how some provision, however inadequate, for means of education accompanied every step in the development of the libraries. The same Committee, the same Reports, and the same Orders dealt with the two subjects together. On this we have the latest illustration in the title which Captain Long has chosen for his paper. But to return to the first catalogue. As we have seen, it bears marks of how the seamen's library sprang out of the old religious books distributed among the ship's company. Subsequently, from time to time, other works were added, but the tradition was persistently recognized that it was a library of moral and religious works. A curious instance occurred in 1840, when Mr. George Cruikshank informed the Admiralty that if their Lordships would allow the late Mr. Dibdin's son to get up an edition of his father's "Sea Songs" expressly for the Navy, he (Mr. Cruikshank) would illustrate them free of expense; and so the question was asked "whether Dibdin's sea songs should be added to the list of books for the religious library."

marine libraries had been successful. I attribute that in a great measure to two things: in the first place, the men themselves contribute towards their cost, and in the next place they themselves participate in the management. I think a useful hint may be hence derived with reference to the suggested Officers' libraries. I quite agree with the idea that those libraries and institutions will be more useful away from London at the seaports, not in England only, but on every naval station abroad. If Officers adopted something on the plan of what this Institution affords a model, they perhaps might ultimately obtain which they desire.

Mr. LAUGHTON: The subject of seamen's libraries is one that has been, for some time past, rather out of my line of observation, and I can only refer to my experience a good many years ago of the great want which was then felt, and which some of the gentlemen present have said this afternoon is still felt, of books relating to the particular station on which the ship happens to be. More than twenty-five years ago I served for a commission in China on board the flag ship. I do not believe that there was a single book of any interest relating to the history or condition of China and the Chinese available, except for those of us who were able to go on shore to the club at Hong Kong. This was the case on every other station. In the Mediterranean, for every book relating to the most interesting history or topography in the world, Officers were, at the time I was last at sea, dependent upon the garrison libraries at Malta or Corfu. Captain Long has urged very strongly the idea of a Naval Institution at Greenwich. I think what Admiral Boys has said on that subject must not be lost sight of. The men that go to Greenwich have their work very fully cut out for them, and are not able to take part in any outside work of the kind referred to. There are of course, as there are at other places, men who delight in work, and others who slide through life doing as little as possible; but neither of these classes are available for the support of such an institution. The men that work have no time, and the men that do not work have no inclination; so that I am afraid such an institution would not be

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We may smile at this, but I believe the recruiting agent who sang at Sans Souci such songs as "The Sailor's Sheet Anchor," &c., &c., &c., will be forgotten when the poet who wrote "Tom Bowline" will survive. In the year 1841 libraries were established in the marine divisions, resulting partly, no doubt, from the benefits enjoyed by ships in this respect, and partly from the influence of a contemporary movement in the Army. The Deputy Adjutant-General, John Owen, on the 6th July, 1840, submitted to the Board the War Office regulation for the establishment of barrack libraries for the use of non-commissioned officers and soldiers of the Army, and requested that the like benefit might be extended to the Royal Marines. The submission was approved, and provision accordingly made for the object in the Estimates. Gradually the seamen's library expanded, but the tradition of its origin remained in the fact that the Senior Chaplain of Greenwich Hospital received an allowance for duties in connection with the selection of new books. A new departure was taken in the year 1862, in consequence of the very important Report of the Committee, consisting of Captain A. P. Ryder, Captain R. Coote, and Rev. Thomas J. Main, R.N. This Report proved the groundwork of Admiralty Circular No. 18, 29th July, 1862, with the catalogue of books then sanctioned. This was, in fact, the first secular library on board our ships. A regulation was introduced by which the Chaplains could be independently supplied with religious publications for distribution; and religious books were not wholly excluded from the catalogue, but those were selected which inculcated morality and religion in the form of tales and allegories rather than those of an abstract character. All the suggestions which have since been put forward for the improvement of the library were in some measure considered by this Committee, and the catalogue has been revised from time to time in accordance with the principles then recognized. The chief features of change since have been the introduction of books adapted for Officers rather than seamen, the addition of books affording special information supplied to different stations, and allowing some books of reference. Thus the seamen's library is being transformed into the ship's library. But this does not yet fall under the province of history.



supported at Greenwich. Portsmouth again has been suggested, and it might seem as if Portsmouth were a very natural place for it; but it is within the experience of some of us that, ten or twelve years ago, a small institution was started at Portsmouth under the auspices of Commander Hubert Grenfell, then a Lieutenant; that it lasted as long as Mr. Grenfell was there himself to push it, and that it died of inanition as soon as he was promoted and left the place. I am very much afraid that any other institution at Portsmouth would have a similar fate, unless it were made a compulsory thing, and that I think would always be received with disfavour. London itself seems to me the natural home of such an institution; and it might be worthy of consideration whether it might not be ancillary to this Institution as a centre. It seems to me that some development of this Institution in this special direction might possibly be arranged. With regard to the shore-going libraries, Captain Dawson made, I think, a decided hit in saying that their value increases enormously in proportion to the distance from London. The different special libraries in London, though exceedingly valuable, are dwarfed by the British Museum; and it seems to me that any one who is really in earnest in working up a subject may go there. The one difficulty is perhaps in living when you are there. If they could only devise some way of ventilating that magnificent room, study would be as pleasant as the advantages are great. Libraries such as Captain Long has spoken of, if at Portsmouth or Plymouth, would be extremely valuable; and I think it is very much to be desired that good libraries of Service interest should be established at those places. As far as our library at Greenwich is concerned, I must say that the Admiralty is, on the whole, very liberal to us: our great difficulty is that we cannot get any old books. Books that are new, that are to be got merely by going to a bookseller's shop, we have no difficulty about; they are liberally supplied on demand. But old books, which have to be got specially, or to be picked up when opportunity offers, cannot be supplied, and we have no possible means of getting them. The librarian is not authorized to spend a penny, and the Stationery Office will not take the trouble. The stereotyped reply to any such demand is, "Out of print." Some time since I asked the librarian to apply for Lord Chatham's correspondence. I told him that any second-hand bookseller would get a copy for a very moderate sum, and he might mention that in his demand. He did this, and the reply was as usual, "Out of print." Of course we knew that before. It is just the same with regard to old voyages and many other books that would be of very great interest and value: anything out of print we have no possible means of getting. Last year in the course of my lectures, referring to the celebrated case of Admiral Byng's trial and execution, I spoke of the published minutes of the court-martial as in the library, and recommended my hearers to read it for themselves. I afterwards found, rather to my surprise, that the book was not in the library. I spoke to the librarian about it, saying that it ought to be there, and that he could buy a copy for three or four shillings. His reply was that he had no authority to lay out three or four pence; it follows therefore that the book is still not in the library. There are several of these professional books that might be picked up for very paltry sums; but we have no possible means of getting them except by private liberality.

Captain FITZGERALD, R.N.: I wish to back up the lecturer so far as to say that there is great room for improvement both as to the variety of books and their distribution. No doubt we have got beyond that stage to which Mr. Harbord referred, where Dibdin's sea songs would be classified as religious books, and where there used to be a column in the charge sheet for soap, tobacco, and religious books, which all came under the same head. The bluejackets read now, which they did not do before, and consequently the libraries require improving. With regard to the time at Greenwich for carrying on the institution spoken of, I do not think there is time. The students are all too busy. They have no time to read in the library even. Those that work have their work cut out for them, and they have no time for anything else except a little recreation such as lawn tennis. Those that do not work at their regular work will not be likely to do anything voluntarily in the way of reading. It might, I think, be worth considering whether anything arises out of all these discussions. I trust I shall not say anything uncomplimentary to this Institution, but it appears to me that these lectures are read, discussions follow, and

nothing comes of it. I really do not know why something could not be done to make the Institution more popular, so that more notice should be taken of what is done here. I see Captain Long remarks that it does not receive that support which it might be expected to receive from the Officers of the Army and Navy. I think that perhaps one reason why it is not so popular as it might be is, with all respect to the present lecturer and others, that the lectures are stuffed rather too full of statistics. I should like to see the subjects set forth in a more general and popular way, so that people might grasp a subject more easily; these statistics roll off one's mind like water off a duck's back. When I mentioned to some friends that I was coming here, and asked them if they were coming also, they said "Oh no, they were not going to the United Service Institution; what's the use of it?" They seemed to have some apprehension of a long string of figures, and that frightened them off.

Commander HULL: The second part of the title of this lecture is "On the Best Means of Diffusing Information amongst the Officers and Men of Her Majesty's Navy." Now a remark made by Captain Curtis struck me very much, and supposing that this paper has a little more luck than those to which our worthy friend opposite referred, and something is done in this matter, the selection of books for sailors would become a most important duty. Captain Curtis mentions a good encyclopædia as necessary. Now I would submit "Chambers' Encyclopædia," as one not too learned, and yet a work able to answer clearly the questions a sailor might put to it. It also contains a fair set of maps. I think if it were placed on board ship it would be found useful to the ordinary practical man. A ship's library must necessarily be small, therefore much depends upon the selection of the books. The station a vessel is ordered upon should be taken into consideration, and works supplied descriptive of the countries and towns on that station. The extract from Captain Grenfell's letter is most instructive. Officers arrive upon a station knowing little or nothing about that station. Captain Bedford, of H.M.S. "Monarch," has done his best in his "Sailor's Handbook," issued in January last, to meet this universally felt want. No pains have been spared upon his part to make this work effective. Letters were written to brother Officers serving on the various stations asking for co-operation, and you will be pleased to hear that his call for information was zealously responded to. I would ask if that useful little yellow book, approved, as I hear it has been, by their Lordships, has been supplied to the Navy?

Mr. HARBORD. It has been issued.

Commander HULL: I know there has been some correspondence upon the subject, but I question if it is yet to be found on board H.M. ships. Unless pressure is brought to bear, useful works are liable to hang between the Victualling Department and the Stationery Office. The real wants of the sailor are frequently lost sight of in the all-powerful desire of the clerk to reduce expenditure. If necessary information is not given in a truly liberal spirit, the State must suffer. One gentleman has asked, "Who is it that supplies the ships' libraries? On whose decision are books placed on board ship?" I believe it is the business of a clerk belonging to the Victualling Department, so that it is still a question of books, soap, and tobacco. It would be a great advantage if the selection of books for sailors could be placed in the hands of an intelligent sailor, acquainted with the wants of his brethren of the sea; for to be of the use wished for by Captain Long, a ship's library should be like her chart box, a matter for the earnest consideration of a practically scientific man.

Admiral STOPFORD: Some remark has been made as to the unattractiveness of the lectures given in this Institution. The lecture to-day has been very interesting, but unfortunately there is a very small attendance. The best attended lecture ever witnessed here was one given by Soyer on Cookery.

The CHAIRMAN: One reason why we have a smaller number here to-day is because this is a *naval* question. It is often the same when the lecture is purely a military subject. When the question is one of joint interest to both Services, military and naval, there is a very large attendance. I am not at all myself disappointed in the number present to-day. I never was disappointed about small numbers, because I consider the principal object of these lectures is that they should be disseminated in our "Journal," and a lecture appears in the "Journal."

just as much whether there are three people present or fifty. With regard to seamen's libraries, I was on one of the renowned Committees with my friend the Rev. Professor Main some years ago, on this subject of seamen's libraries, and we took a great deal of pains to find out the state in which the libraries came back from the ships. All the books that were missing, probably worn out, or that came back excessively well thumbed, we replaced on the list, while those that were uncut we excluded for the time. I believe there is, or is to be, a permanent Committee on ships' libraries, and very careful consideration has always been given by the Admiralty as to who is to select the books to form the libraries. The name of Dibdin has been mentioned. When I was Commander-in-Chief at Portsmouth the other day, I met Commodore Luce, of the United States Navy, and he told me that he had undertaken to make an American "Dibdin," which he said he was afraid would not be very popular in the British Navy, and of which he courteously said he would send me a copy. He has done so, and certainly some of the songs are not particularly pleasant reading to an Englishman, but still they are got up in a capital way, and form a good song book for American seamen. When I was Commander-in-Chief at Portsmouth I persuaded the Admiralty, after some correspondence, to open a splendid room—the study in the old College there—for the purpose of a library and lecture room. They were very good about it. The room was a particularly cold cheerless one. They warmed it with hot water pipes and put up tables and book-shelves, and in fact it would remind you of a very large Oxford library, *except that there were no books*. However, the Admiralty did their very best to obtain a small grant from the Treasury, only 50*l.* a-year, for the purpose of creating a library in that room for the use of Naval Officers on full and half pay, who could come in from Southsea and use the books for a small annual payment. That little sum of 50*l.* a-year was refused by the Treasury and there will be no library there in this century, unless the Admiralty insist upon it, backed by professional opinion, which tells gradually upon public opinion out of doors. This, I think, is the real use of what is said and read in this room. A gentleman asked just now, "What comes of all these discussions?" Well, it is difficult to measure by an inch or a foot exactly "what comes of them." All the proposals and suggestions made in this Institution, if they are good for anything, make progress, however slow, by the gradual saturation of public opinion. If they are good ideas, in the end they tell, if they are bad, they do not. All we can do here is to ventilate suggestions and proposals, and in the end we may hope to have some good result. I happened to hold the appointment for some time of Naval Attaché, and enjoyed the opportunity of visiting foreign European countries. I followed a first rate man, the lamented Captain J. G. Goodenough, and one of the subjects we both paid attention to was the naval educational systems of the different maritime countries. We found they were well worthy of attention. They were very different from one another. There were interesting variations in the way they treated this important subject. What I was most struck with was the *Russian* system. The Russians are a most persevering nation, and are taking great pains with their Navy, especially from one point of view, viz., as a *defensive* force. I landed at Cronstadt, and went over their naval establishment there. There was a splendid library, open to all Naval Officers, with a large sum, 1,000*l.*, granted to it every year. As we walked through the rooms, I saw a number of tables. I asked my companion and guide, the Russian Captain Bajenov, what the tables were for; and he took me to one. That was the *English* table, covered with English naval professional newspapers and periodicals of the latest dates from England, with our "Journal," and all the other professional serials. Further on was the *French* table, and the *Italian* table, and the *American* table. You saw two or three Naval Officers at the English table, and others at the different tables reading, notating. Now that is something like giving assistance to Naval Officers, and that is what I have been asking for for years for our seaports. I hoped when I was at Portsmouth that I should, at the close of my professional career, have been enabled to enter the edge of the wedge to assist in establishing a library and reading room; these to be followed by others at the headquarters of each naval station—Plymouth, Chatham, Sheerness, Malta, Hong Kong, Bermuda, &c. I have just told you that the room at Portsmouth, with bookshelves round it, does for lectures, but it is a mere

skeleton, they are doing no good at present. I was enabled to establish, fortunately, lectures on professional subjects, and several days previous to each lecture I distributed a slight printed sketch of how the next subject could be treated usefully. We had a large number of Naval Officers. After a little while, when they found there were to be no reporters present, and nobody was to repeat what took place, they soon got more free in their way of talking and asking questions, and shortly before I left there was an attendance of some thirty or forty Officers, who took part in several interesting debates. The hour was 5 P.M., and I allowed the Officers to attend in the plain clothes they had been playing cricket in, &c. I believe this last-named concession made all the difference as to the attendance. So that my project was fairly started, and shown to be quite possible. Again at Plymouth, Sheerness, Malta, Hong Kong, Bermuda, Valparaiso, wherever a room can be obtained, professional text books, newspapers, and periodicals should be sent. I maintain that the Admiralty would do well to provide these aids for the continuous information and education of Naval Officers, in order to give them the opportunity of studying the scientific side of their profession. It is very easy to say that Naval Officers should provide themselves with their own text books. Well, then, the Treasury, who refused the subsidy to the library, must give Naval Officers a good deal more pay if they expect them to provide themselves with these expensive text books. The real thing is to place these libraries of text books, &c., in central situations, and then encourage Naval Officers to use them by official encouragements and approbation, and thus secure that every advantage will be taken. If only the opportunity is fairly given to my brother Officers, they will avail themselves of it. At present they are handicapped as regards foreign Naval Officers. When I was an Attaché, my duty was to go to all the European seaports and interview the Consuls, and I found they were all excessively anxious to draw up thoroughly good reports, and to send them home, but at that time it was, I found, perfectly impossible to persuade the authorities even to print the Naval Attachés' and Consular Reports even for their own information. Now, happily, thanks to the present naval authorities, an institution has been created by the Admiralty, following in the footsteps of the Intelligence Department in the Army. That Intelligence Department in the Army, for many years before the Admiralty took any steps in the matter, printed all the Military Attachés' Reports, and reserving of course those that were specially confidential, issued the others to every Officer in the Army who wished to work at his profession by studying what other countries were doing. I am informed that all Officers have access to these Reports. We in the Navy have got to this stage, that we have got a capital Officer at the head of the Intelligence Department, Captain W. Hall, and I hope that the reports he collects will be printed confidentially or otherwise as may be found advisable, and that in some way or other Naval Officers on the active list will have access to them. Reference has been made to Captain Philip Colomb's war games, and this is a little illustration of what I have been saying. Captain Colomb, who is a very intelligent Officer, invented a naval war game, and when he was in London, and not employed actively, he came here, and his war game was worked on that black board with great interest to all of us who attended. Some capital tournaments were carried out. Then he was appointed to Portsmouth Steam Reserve, and was too busy to work at it. The result is, it has fallen out of use in England. On the other hand, we hear that they are working it thoroughly at Cronstadt, in Russia, while we, from the want of encouragement at headquarters, are neglecting it. A question was asked about the seamen's library. I have made much use of the seamen's library on board the ships I commanded. It certainly is a *ship's* library, for there are many books in it that a seaman would not care to consult. I find many of them useful to me. Whether they can be exchanged between ship and ship or not, I do not know. When I was Commodore of the Coast Guard, I allowed each station (there are several hundreds) a month to read a small set of books, and on a certain day every month the whole of the books went one pace to the right round the coast. They made a march one pace to the right to the next station, and so in that way there was a constant change of books at the stations. Whether that could be managed on board ship with the libraries I am not quite certain. Greenwich is an institution deserving of all praise. That Mr. Gladstone should have been member

for Greenwich, Mr. Childers, First Lord, Sir Andrew Clarke, head of the Admiralty Board of Works, and Sir A. C. Key, President of the College, at the same time, was a most fortunate combination of events, for which Naval Officers cannot be too thankful; but Greenwich is a mere incomplete fragment, without its supplementary libraries and lecture rooms, at present non-existing, at the different home ports and foreign stations. Naval Officers are invited to go to Greenwich once in each month and study; so far good. They are encouraged when on half pay to go through short gunnery and torpedo courses; so far good. But the greater part of an Officer's time is spent on foreign stations. It is there that he might be helped and encouraged to spend wisely a large portion of his leisure time in studying the accomplishments of his profession. I am sure you will authorize me to thank Captain Long for his most interesting lecture; and I may say whenever a gentleman lectures here and makes suggestions as to the action of the Council, it is only right and fair that the gentleman in the chair should state whether he is prepared to support them or not. I shall have much pleasure at the next Council meeting in bringing before them the suggestions of Captain Long so far as they bear on the action of this Institution, and to support them as far as I can.

Captain LONG: I have very few words to say in reply. When all Officers are educated at the same place they naturally look to that place as a centre; but before the Royal Naval College at Greenwich there was no centre. Several gentlemen have noticed that Greenwich is not a good place for the proposed institute. It depends upon what is the object of the institute. To my mind it is simply a place where there would be a library, and to which papers would be transmitted. It was not in my mind that it would be a place where much discussion would go on, because all the Officers who are best qualified seem so very busy that they say they have no time for discussions; but Officers who are afloat might be induced to write things. They have time, and besides, as Captain Grenfell so well puts it, many of the reports of Officers afloat which are now locked up might be transmitted to the institute. There is a chart now always hung up on the lower deck of one of Her Majesty's ships, and the position is marked up every day for the crew to look at. There is at present no interchange of books afloat. I believe that Dibdin's songs are in the library. Lord Henry Seymour and Captain Hull both ask who has charge of the selection of books. I am informed at the Admiralty that books proposed by anyone are bought if the Board sanction it. Of course the provision of books is financially under the Department of the Director of Victualling. Captain Bedford's "Sailor's Handbook" is in the library. Captain Johnstone asked about the Admiralty Library. I was told by the librarian that any Naval Officer who wished to consult a book could go there to consult it. In the present building there is no good place for the library, but in the new building a place will be found for it. I quite agree that the present seamen's library is in reality the ship's library, but it is not so called, nor so furnished; it has gradually grown up. A great many books have found a place there that are evidently not meant for seamen.

Captain CURTIS: Might I suggest that it should be mentioned in the Journal of this Institution that Officers can have access to the library of the Admiralty?

The SECRETARY: I may mention that I have just spoken to the Russian Naval Attaché, and he very kindly promises to send us the Russian scales, &c., used in their naval war game.





## NOTES ON RECENT SURVEYS ON THE AFGHAN BORDER.

By Major HOLDICH, R.E.

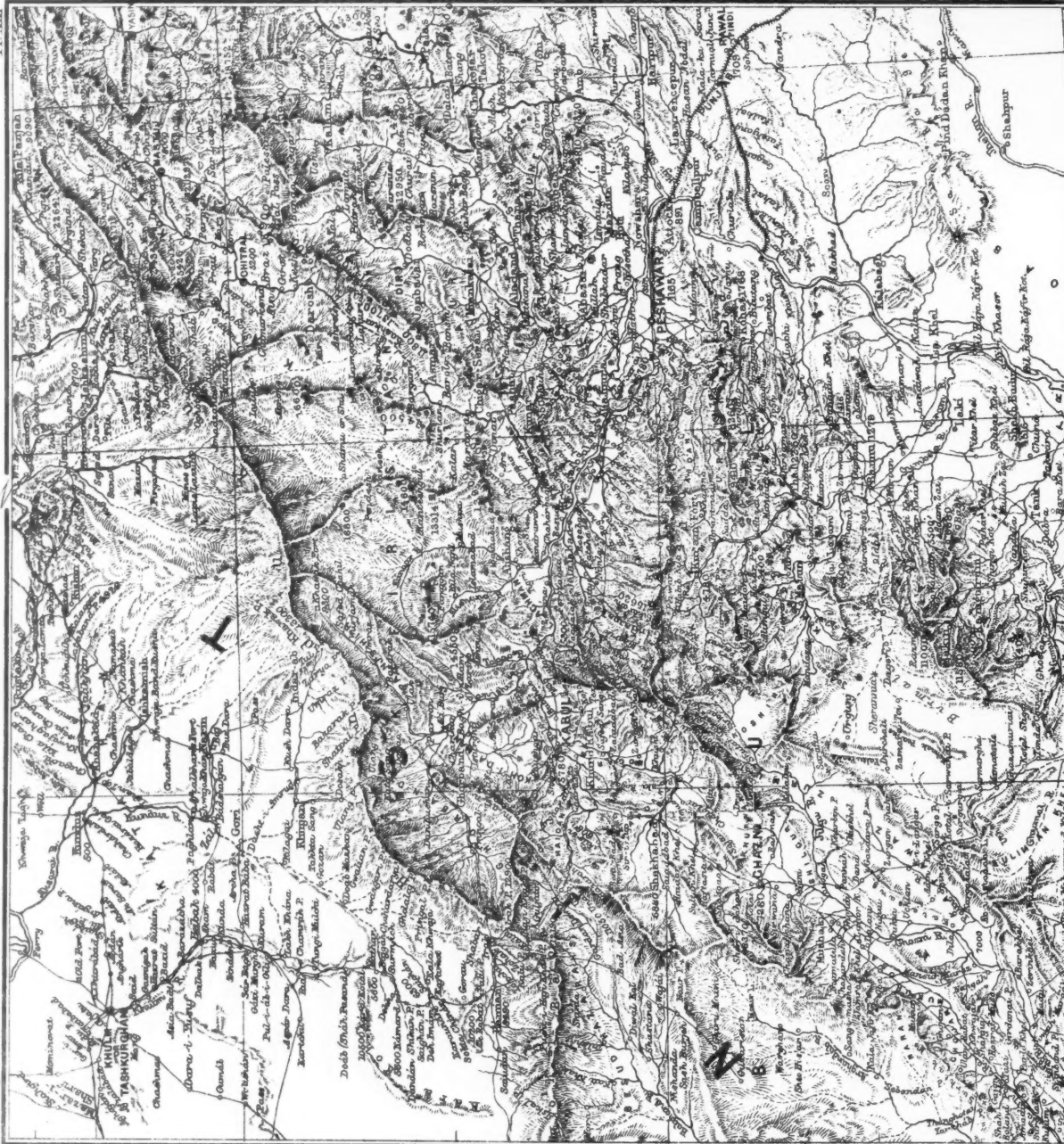
Not long ago a paper was contributed to the Journal of the Royal United Service Institute by Sir E. Hamley on "Russian Approaches to India," dealing with the general aspects of the question from new points of view established by the altered conditions introduced by the more advanced position occupied by Russia. In that paper reference was made to the geographical and strategical conditions which cause us to attach so much importance to the Afghan frontier; and, in this again, our recently extended knowledge of the geography of Central Afghanistan, and the more intimate acquaintance with frontier passes recently acquired by surveyors, justifies a few notes on the subject, from which possibly a better estimation of the military value of our frontier barriers may be formed.

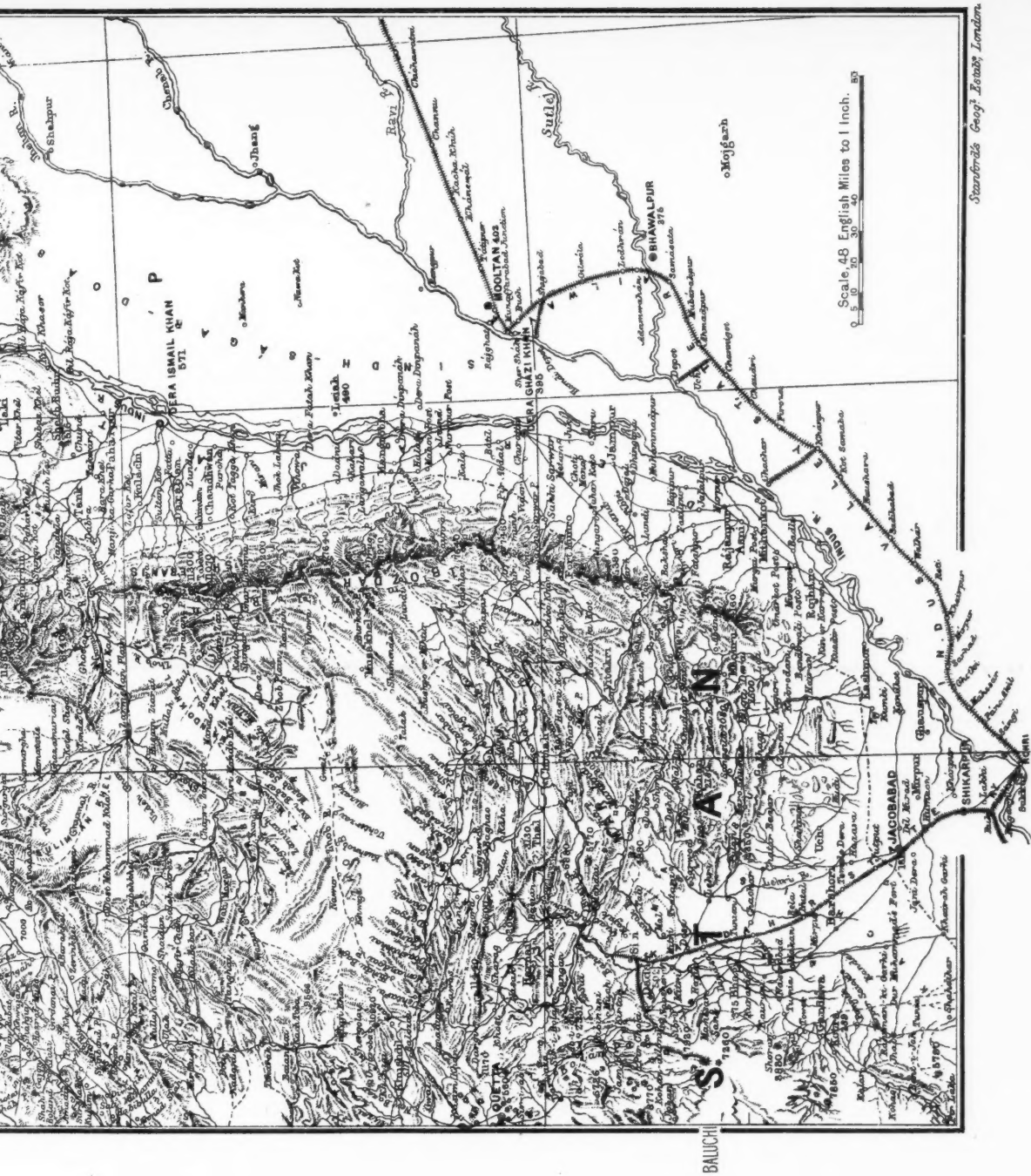
One serious, but necessary, defect in this paper is the absence of a complete map. It is possible to state in general terms what has recently been surveyed, but it is not possible to point out those results in detail on any one map, for several reasons. Fresh geographical and topographical information is acquired so fast, such enormous areas are traversed by explorers, and field mapping is completed with the plane table so quickly, that long before a trans-frontier map covering any large area of country is ready for publication, it is in need of extensive revisions and additions. Often before we can turn out a geographical map, we have materials for fairly good topographical delineation. The only resource is to reproduce field maps by photozincography quickly, and deal out information in such scraps as it comes to hand. To this may be added that the Indian Government recognizes no distinct establishment for this sort of survey. It is carried on *pari passu* with the ordinary work of a large survey party, working within the limits of British India, and bound, before all things, to produce maps and reports of its own legitimate revenue and topographical surveys, and not to be seriously interrupted or interfered with by the less productive efforts of trans-frontier explorers.

To commence with Northern Afghanistan, and the passes from Afghan Turkestan to Kabul, or from Badakshan and the Pamir into the valleys leading to Chitral or Gilgit. Although no point so far north as the Khawak Pass leading from the head of the Panjshir

Valley to Faizabad was ever reached by a surveyor during the Afghan Campaign, yet the position of all the prominent peaks of the Hindu Kush from this point westwards and southwards, as far as the Irak Pass, which connects Kabul with Bamián, and even about the Koáh-i-Baba and Gulkoh ranges, was then determined; and the crest of the Paghmán, which is but a gigantic spur of the Hindu Kush overtopping the main watershed, was reached by several Officers. The nature of this part of the Hindu Kush is consequently well known. It is of no great altitude. The highest peak observed near the Khawák Pass is only 16,000 feet above sea-level and barely 10,000 above the Kabul plain. None of the principal passes in this region are likely to be more than from 10,000 to 12,000 above sea-level. The Irak, or Bamián, Pass is the trade route of the present day with Turkestan; and a great trade route throughout Central Asia and Afghanistan means a route accessible to armies moving under modern conditions of transport and equipment. Between the Irak and the Sar Alang (north of Charikar, the route followed by the present Amir when travelling to Kabul from Turkestan), are innumerable minor passes, locally known as "durras," all of which are doubtless open to foot passengers for the greater part of the year. Between the Sar Alang and the Khawák, of which we have no very recent account, are said to be quite as many of these bye-ways connecting the Panjshir Valley with Badakshan, as in any other part of the Hindu Kush system. It is unlikely that these minor passes would prove of any practical value for military purposes. Those that have been seen and explored are used for driving cattle (and sometimes even unladen camels) up to the high level pasture grounds in the hot weather; but no laden baggage animals could pass by them. The pass to the summit of the Paghmán range was found practicable for an infantry escort to the survey parties, as late as November, and as early as May; and this pass led close to the highest peak of the Paghmán, a peak that overlooked the main Hindu Kush watershed, and is probably as high (with perhaps one or two exceptions) as any peak to be found on the Hindu Kush as far east as the Nuksán Pass. But, whether practicable or not, their existence proves the general accessibility of the watershed. Between the Khawák and the Nuksán Passes it was supposed until recently, that the Hindu Kush watershed, dividing the drainage of the Oxus and the Kabul, was of great altitude. But recent surveys by an explorer in Kaffirstan dispose of this idea. It is not perceptibly higher than its extension westward already referred to. From it southward huge outworks or buttresses strike off, of far greater altitude than the watershed itself. The giant Tirich-meir (25,000 feet above sea-level), marks one of these gigantic southern spurs, which culminate in a mass of magnificent snow peaks in Kaffirstan and Kashmünd. Their configuration partakes very much of the nature of the Paghmán range (itself an offshoot of the Hindu Kush), in their frequent tendency to run parallel to the main watershed, dividing off narrow lateral valleys, the drainage of which, turning suddenly at right angles, cuts through the general direction of the watershed. This, either on a large scale,

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or a small one, is a marked and most common geographical feature throughout Afghanistan. The Panjshir drains one of these long narrow valleys, the extent of which has not yet been accurately defined on our maps. The Panjshir doubtless rises very far east of the position at present assigned to its source.

About the passes across the Hindu Kush east of the Nuksán, including the Dura, which directly connects Chitrál with Jarm and Faizabad, the Tirico (called Rich in Turkestan maps), from Drázan and Chitrál to Kila Panja on the Oxus, the Baroghél connecting Mastuj and Chitrál on the one side, or Yasin on the other, with Sarhad: and the Darkót, more direct, though higher than, the Baroghél: we now have the excellent information obtained by Mr. McNair in his recent journey to Kaffirstan. The position of all, and the approaches to them, have been accurately laid down, for Mr. McNair carried his plane table with him, and had no lack of well fixed peaks around him from which to interpolate topography in as full detail as the limits of time would permit. So long as his maps remain unpublished, it would be inexpedient to refer in any detail to his reports, which may very well be left to illustrate the maps; but a few general remarks may not be out of place. The low altitude of the main watershed as compared with some of its southern spurs seems to be established. All the main passes referred to may fairly be called *easy*, but the limits of time during which they are open of course varies with their altitude. The Baroghél is the only one which is nearly always open; its altitude being probably rather below than above 12,000 feet above sea-level. The Dura, which is higher (but also an exceedingly easy pass), is practically closed for trade purposes by the lawless habits of the Munjánis, a section of the Kaffirs occupying the northern slope of the Hindu Kush stretching down into Badakshan. Previous reports of the generally friendly feeling of the Kaffirs towards Europeans have been fully confirmed. Whether the tradition of their own Greek origin is well founded or not (and in the absence of written history such traditions always deserve respect), it has been sufficient to induce them to welcome a European visitor very cordially, whilst, at the same time, guarding their gates jealously against intrusion from Mahommedans. No country that we have yet had to deal with has proved so difficult of access as Kaffirstan, and no country has offered more facilities for exploration when once reached.

Round about Kaffirstan, fringing its borders on the east, south, and west, if not on the north, are Mahommedan races, originally of Kaffir origin, which have more or less recently been converted to the faith of Islam—such as the Sáfis, Dehgáns, Nimchas, &c.—who, of all Mahommedan peoples north of India, are the most fanatical, and most utterly opposed to intercourse with Christians. Thus we have, just bordering the passes from the north into the valleys of the Panjshir, Kunar, or Gilgit, a strong and warlike race of people in the Kaffirs, of whom it may confidently be said that they would ally themselves readily with a Christian nation against the fierce and fanatical Mahommedan tribes who actually hold those valleys, and

whom it would be difficult, if not impossible, to persuade into any really practical compromise with Christianity.

It is only with difficulty and risk that the geography of the great southern offshoots from the Hindu Kush is being slowly unravelled by Indian surveyors, owing to the uncompromising hostility of these Mahomedan tribes. The northern spurs and slopes (with the exception, perhaps, of some parts of Badakshan), on the contrary, have not proved by any means insuperably difficult to Russian geographers, who now have but little to learn of the topography of the regions of the Pamir, of Darwaz, or of the far northern Afghan provinces, Wakhan and Shignán. Probably they know more of the valleys of the northern Hindu Kush slopes than we do of the southern side. There are many good reasons for the success which crowns their enterprise and energy, and amongst them, no doubt, is the fact that the northern people are not really so hostile to Christian explorers as are the southern tribes. Many facts lead to the conclusion that the Mahomedan people south of the Hindu Kush would band themselves into far more formidable opposition to any sort of Christian influx than would those on the north of the main watershed.

But, after all, these northern passes into India are but of secondary importance compared with others which lead more directly to the frontier further south, and which are but links in the direct line of communication between Kandahar and the plains of India. Our geographical knowledge has recently been very much extended into the interior of the plateau; whilst more regular surveys of the borderland between this plateau and the plains have set at rest much vague conjecture as to the value of many of these frontier passes. First and foremost, perhaps, in interest amongst questions recently raised is this: Whether, in utilizing the passes of the Khyber and the Kuram to reach Kabul, we chose the most direct, the most accessible, or the best strategical line? Next, it is interesting to note that we must for ever abandon the idea of Central Afghanistan west of the Sulimán range, or of that range itself, as presenting any sort of effectual barrier between Kandahar and India.

The Khyber Pass and its surroundings, as well as the Kuram, and most of the country intermediate between it and the Khyber, was fairly well mapped during the Afghan War, and the political or military conditions governing the value of these passes will be too familiar to need recapitulation; but there is a good deal of scientific military interest still attached to one portion of the frontier intermediate to these two routes (*viz.*, that occupied by the Affridis and Jowakis), on account of its bearing on our line of frontier communications. It is a singular fact, that our greatest frontier road—the main line connecting Peshawur with Sind, on the right bank of the Indus—still passes for about 40 miles of its course through Affridi territory. We are still dependent on the kindly feeling of the "Pass" Affridis for permission to pass unmolested from Peshawur to Kohat. Whatever may be the exact terms of agreement on the subject of the pass between the Indian Government and the Affridis, the fact still remains that the pass is not our own, that it can be

closed against us at any time. A gigantic wedge of hill country is driven forward, like a huge ravelin, from the Afghan border into our territory till it nearly touches the Indus, and across the middle of that wedge lies the road from Peshawur to Kohat.

No doubt, from the financial point of view, it is not worth our while to occupy this block of unproductive and unprofitable country, but, from other points of view, it might be as well to ask whether it is worth our while to let anyone else occupy it. It is a strong advanced position to the Afghan border, completely commanding the road between our only bridge across the Indus at Kushalgarh, and Kohat; and it is a most excellent outwork in which to collect armed forces, sufficient for a raid on Peshawur or Kohat, without our being aware even of their gathering. Yet, within that wedge, at the base of it, is a district by no means unprofitable, called Maidán, with fairly good means of communication with the Meranzai valley west of Kohat, and possessing an excellent climate—a district which may prove of importance hereafter, should we ever decide to reverse the trace of our frontier line at this point, and carry our advanced post over their border, instead of permitting theirs to be pushed across ours. We have surveyed all round this fertile and elevated valley, but never actually into it. One surveyor, disguised as a native, and associating with a band of Pathan Shikaris, reached points of command from which he overlooked the Orakzai Tirah, and was able to map a good deal of Maidan on his plane table; but the country is mountainous and close, and another plucky attempt to reach points from which to overlook the Bára valley, which connects the Tirah and Peshawur Plains, failed. However, the course of the Bára is fairly well known, and his report of Maidán confirms, in a general way, native accounts of its great natural fertility and of its delightful climate.

Our farthest frontier post, west of Kohat, during the Afghan War, was that just opposite the base of the Kuram Valley, on the left bank of the Indus. Between that and Bannu (the next great frontier station south of Kohat) is a direct road, following approximately the course of the Kuram river. Here, again, have we resigned our direct line of frontier road into the hands of our neighbours, the Waziris; for the Kuram passes southwards along the base of another such wedge as that described already, only far smaller, and of vastly less consequence. Until lately, we have had no map of that second indentation into our frontier line; but, in 1882, Mr. McNair was allowed, under certain stringent conditions, to take his plane table over it, and from there, under the same difficult condition of never sleeping on the far side of the border, he continued southwards to the Dawar (or Tochi) Valley, carrying his work sufficiently far westward to ensure connection with the Afghan and Waziristán surveys, executed during our military occupation of those countries south of Waziristán. An admirable plane table survey, in detail, of the Gomul Pass, was carried out by a native surveyor, under the safeguard of Waziri Chiefs, last winter; whilst west of Waziristán a well-trained explorer has mapped the rest of the great debateable land called Birmal, and

whilst setting at rest the geography of the Upper Tochi, and defining the critical part of the great high road between Ghazni and India, has shown its connection with the Gomul.

Here, then, we have at last fairly good data open to us for forming some conclusion about this highway into the heart of Afghanistan, which is afforded by the Tochi, or Dawar, Valley over the Jadrán watershed, to Ghazni. The Dawar Valley was mapped during the Waziristán expedition. It is an open, fertile valley as far as Sherannia, the farthest point from which there is any trade to India; and the only real point of difficulty that presents itself between Sherannia and India is the entrance into the Tochi Valley across the frontier line. There are three ways of effecting this entrance from Bannu, all of which are practicable, and might be made easy. The best at present is that known as the Barán, leading past the Sher-i-Talla Plain (where the remains of an old encampment of Mahmud of Ghazni may still be seen) into the Lower Tochi. Through the whole length of Upper and Lower Dawar (for there are really two valleys, separated by a short and unimportant "tangi" or waist), to Sherannia, the road is well enough known. From Sherannia onwards across the watershed between the Helmund and Indus to Sarafza, at the western foot of the Jadrán hills, there are several routes, not quite so plain or open, but offering no great difficulties. That passing by Urghún (or Warghin as the Mahsud Waziris call it) to the Kotani Pass is the simplest. From Sarafza, again, to Ghazni is a broad open country, offering absolutely no obstacle to military movements. The result of all investigations so far has been to prove the wisdom of the great Ghaznvide, who selected this route for those of his raids into India which were not aimed directly at Peshawur. The native explorer (the "Syad") who traversed between Sarafza and Ghazni was unluckily suspected and imprisoned at Ghazni; and was carried thence to Kabul: from which place, however, he was allowed to return to India with no worse mishap than the loss of his field book. Of this part of the route, therefore, detailed information is wanting, nor is it of great consequence, as the country is known to be open and fairly well cultivated, and there are abundant means of communication. The strategical advantages offered by the position of some of these well-watered and fertile high-level valleys near the sources of the Tochi River should not be overlooked. To the west and south-west of the central watershed from which they spring, are wide open plains, undulating slightly as they recede from the Jadrán hills, and gradually flattening out into a broad level, broken only by narrow ridges and isolated hills, across and through which are easy roads to Ghazni, Khelat-i-Ghilzai, or Kandahar. These plains are occupied by strong Ghilzai clans, such as the Kharotis, the Sulimán Khel, the Násirs and others, which together form the strongest of all the great divisions of the mixed Afghan nationality. It is from this great plateau that the trading classes with India chiefly spring. The Povindahs, who pass yearly with their thousands of camels through the Gomul and other contiguous passes, into the plains of India, are chiefly these Ghilzai people; and a very slight acquaintance with

these sturdy wanderers is sufficient to convince anyone that they must hail from a land blessed with a magnificent climate. But the general level of it is very high—so high as to render food and fodder scarce in the winter months. A thorough command of this part of Afghanistan, with all its numerous roads and outlets, and its fighting people, would be to grip the sturdiest element of Afghan military strength.

From the eastern slopes of the Jadrán watershed rises an important affluent of the Gomul (called the Dwa Gomul), of which the course is not at present accurately known. It flows southward through valleys described as open, till it joins the Gomul to the south-west of Waziristán; and doubtless it affords a road connecting the Jadrán district with the Gomul Pass.

Immediately to the east of the southern continuation of the Jadrán watershed (*viz.*, the Kohnak hills) are the lately-surveyed highlands of Birmal, from which springs the main stream of the Tochi, which, after flowing northward for 40 or 50 miles, takes a sudden sharp bend eastwards to India. This is debateable land—the scene of many a fight between Sulimán Khel and Waziri. The Sulimán Khel appear to occupy it during the summer months for grazing purposes, when grass becomes scarce on the lower levels, whilst the Waziris hold it in winter. The course of the Tochi marks the line of a good road through the length of Birmal, and is connected at its head by an easy open pass across a low watershed with the Gomul system southwards.

To the south-east of our assumed military position lies the great country of Waziristán. Both geographically and politically Waziristán claims a distinct nationality. It seems to be a mistake to include the Waziri mountains in one general system, with Khost to the north and the Sulimán range to the south. They are cut off from the one by the Tochi, or Dawar, Valley, and from the other by the Gomul; and, whatever may be their geological connection with the Sulimán range, it is perhaps more correct to regard Waziristán as a sort of frontier Switzerland, geographically independent as well as politically so. The Waziris are practically a self-governed people, far more amenable to British influence than to Kabul rule, for the geographical reason that their country is far more accessible to India than to the west. There are no good roads leading directly westward through Waziristán, though the Kaisór, the Shakdu, and the Tank Zám Passes all afford means of reaching the heart of the country from India. The Waziris are a fighting people, and their fighting strength is considerable. By a judicious arrangement in the distribution of land amongst the various sections of the great Mahsud Waziri clans, these sections and their subdivisions are so scattered over the face of the country that intertribal feuds are almost impossible. Family blood feuds are as bitterly supported as in any other Pathan community, but any further development of the family feud into a tribal quarrel, leading to destruction of property and civil war, is so discouraged as to be almost unknown. Thus they are a more homogeneous clan, better knit together for common interests than most of

the frontier tribes. In short, they are not a people that can be left out of account in our relations with the frontier, whenever military interests are at stake. As matters now stand Waziristán is particularly open to British influence. Aggression on the part of Waziris can be promptly repressed, and offenders brought to justice without in any way complicating our relations with Kabul: but this would cease to be the case were the Amir to succeed in directly establishing his authority over Waziristán, by placing regular Kabul troops in garrison in strong positions throughout the country. Yet, without active interference on the part of the Indian Government, there appears to be some probability of this being effected.

The Jadrán watershed not only commands the Great Ghilzai country, and to a certain extent dominates Waziristán, but it holds the best route between India and Central Afghanistan. The tribes in the immediate vicinity of that route, or actually occupying the districts through which it runs, are not of great political or military importance, until the route descends the western slopes of the watershed, and crosses the open plains to Ghazni, occupied by sections of the Ghilzais. The Dawaris, or inhabitants of the Tochi Valley, are not a fighting people in the sense that the Ghilzais or Mahsud Waziris are a fighting people. They are cultivators and traders, robbers, of course, but so specially steeped in social vice and iniquity, as to be held in utter contempt even by their not over-nice neighbours. A Dawari is regarded by a Mahsud Waziri much in the same light that a Kashmiri is regarded by a Punjabi Mussulman or Sikh. The Jadránis, or people dwelling in the Jadrán Hills above Urghún, are a primitive race, hospitable and apparently well disposed to strangers, but insignificant in numbers and political consequence. Living amongst these Pathan and Pushtu-speaking people is an interesting colony of Tajaks called Firmallis. Few in number, and with their hands literally against every man, they maintain a position of fierce independence with a success which commands admiration. They are traders and travellers, and amongst them are men of quick apprehension and great intelligence, well informed in all matters relating to the geography of the widespread regions through which they carry their trade. Three points may be mentioned as being of first rate military importance on the route between Bunnu and Ghazni, viz., Sherannia, at the head of Upper Dawar, Urghún, on the eastern foot of the watershed, and Sarafza, somewhat similarly situated on its western side, but nearer to the actual water-parting.

Through Waziristán, as has already been stated, there are no direct routes into Afghanistan, but south of Waziristán lies the well-known Gomul route. This has been mapped in full detail during the last cold weather as far as the junction of the Gomul and Zhob Rivers, beyond which our information is still chiefly gathered from Broadfoot's reports and traverse, constructed upwards of forty years ago. Regarded as a high road to Ghazni it is longer, and beset with more physical difficulties, cramping and obstructing it, than the route to which we have just referred; but on the other hand, it is probably much less liable to be affected by snow and other climatic conditions



than the Indian route, from the fact of its following the line of the river throughout its length. It may be remarked that the Gomul is a greater trade route than the Tochi, but this would hardly be any criterion of its general value for military purposes, directly aiming at communication with Ghazni and Kabul. Most of the trade passing to India through the Gomul Pass is from the great plains occupied by the Sulimán Khel, Kharotis, and Nasirs, to the south and east of the Ab-i-stada; whatever part of it may be from Ghazni, and the Turkestan country beyond, is at any rate in the hands of these same people, whose most direct route to India from their own country is doubtless that by the Gomul. Trade in the Tochi Valley extends very little further than Sherannia, the unsettled nature of the country and predatory habits of both Ghilzai and Waziri tribes would almost effectually prevent the extension of trade by either, through country occupied by the other. The Tochi will never be a great trade highway, but this does not affect the question of its military value. On the other hand, the chief value of the Gomul approach to the plateau lies in the fact that it leads directly to the two great central routes to Kandahar, viz., that passing by the Zhob Valley into the valley of the Kundil, and from thence to Maruf; and that which after traversing the full length of the Zhob Valley passes over the Metrazai Kotal into Pishin. Of the latter very little remains to be surveyed. Its accessibility and advantages are well known. Of the former, a part, which leads from the head of the Kundil across the watershed dividing the Gomul from the Helmund drainage, as far as Maruf, has not been thoroughly explored, and it would be rash to claim it as an easy route, though in all probability it is so. The rest of it has been more or less surveyed.

The Gomul Pass is connected laterally by several easy passes with the next great entrance into Afghanistan, south of it, known as the Shekh Haidar Pass, or Zao. This is the route taken last December by the survey party, which explored the Takht-i-Sulimán mountain, protected by an escort of 2,500 men of the Punjab Frontier Force. At present this cannot be called an open road, though it might easily be made so. The expedition turned south after clearing the northern foot of the mountain, following up the Zao drainage to its source, and then passed over an open "kotal" into the valley of the next stream, called the Dráband. The course of the Dráband is very similar to that of the Zao, running, in fact, upon parallel lines. It drains first from south to north along the back of the mountain, parallel to its main ridges, and then, turning at the point where the watershed referred to parts it from the head of the Zao, bursts through the mountain system by a series of terrific gorges, out into the lower country eastward; finding its way to the frontier by a line running approximately east, parallel to the Zao. It is this chasm, rent through high limestone ridges, that renders the Dráband an impracticable route to Afghanistan. Otherwise it is open enough, and it offers the most direct (and possibly the easiest) route to the summit of the mountain. This is the one commonly followed by pilgrims to the shrine.

From the valleys formed by the heads of the Zao and Dráband, west of the Takht-i-Sulimán, are passes leading more or less directly into the Zhob Valley; so that there is a complete system of easy communications, direct and lateral, behind the Sulimánis between the Zhob, and the heads of the Gomul, the Zao, the Dráband, and the Dahna, all of which lead straight to India. Of these, however, the Dráband must be pronounced impracticable, and the Dahna at present impassable. It should be noted, however, that the Dahna was, not long ago, the main kafilá route of this part of the frontier. The Takht-i-Sulimán mountain in itself offers no advantages as a strategical position. Its altitude is too great. As a sanatorium it might possibly prove useful; its fine climate, magnificent pine forests, and grand scenery would all combine to make it a pleasant resting place for the hot weather; but it is rough and difficult of access, and there is a scarcity of water at certain seasons of the year, which would have to be met by the construction of reservoirs. The Sheránis, who hold the border country from the Sulimán watershed to the frontier, immediately south of Waziristán, are distinctly inferior to the Waziris in physique or fighting capacity. The tribe, too, is subdivided into sections, which live in separate districts, and practically acknowledge no common leader. There is an absence of cohesion about the Sheránis, which increases the difficulty of dealing with them politically, and renders it peculiarly dangerous for Europeans to explore their country. One section only (the Kedarzais) resisted the ascent of troops to the summit of the mountain; though, possibly, had they been in any degree successful, they would have been supported by other sections of their clan.

South of the Sheráni country, to the latitude of Dera Ghazi Khan and Fort Monro, the Sulimán watershed is held by a variety of wild Pathan tribes (Ushtaranas, Bozdars, and others) all practically independent of Afghanistan, and more or less favourable to British rule and interests; whilst below them, between the watershed and the frontier line, is a strip of wild, broken, inhospitable country, of which the inhabitants may be said to be entirely under British influence. It is beyond the watershed to the west, on the slopes and plains adjoining them, amongst the widely scattered tribes of the great Kakur race, that difficulty is experienced by surveyors; still, with the survey of the Vihowa Basin completed, it may be said that every pass and road of importance into the interior of Afghanistan, as far south as the Bolán, has been fairly explored and its capabilities sufficiently well estimated. The Vihowa drains a small area, but not an unimportant one. Near its source are fine open valleys well supplied with water and grass, and, in spite of the unusually unsettled nature of the people in these parts, not without cultivation. From it, as might be expected, roads branch off into the great open plateau country to the west and north-west, whilst others running south connect its head waters with the Bori and Thal-Chotiali Valleys. An important pass leading directly across the Sulimán range by easy gradients to the Bori Valley or Thal-Chotiali was explored last year by Mr. Fryer (Deputy Commissioner of Dera Ghazi Khan) and

Colonel Lance of the 2nd Punjab Cavalry. It forms a valuable alternative route to that taken by Colonel Wilkinson through the Bozdar country when returning to India from the Pishin in 1881, being both shorter and easier. From its mouth to the foot of the main ridge of the Sulimánis, the Vihowa is connected laterally by smaller, but not unimportant, passes leading northward into the Kaora (another pass across the watershed connecting the Afghan plateau with India, lying between the Vihowa and the Rimmak) and southwards with the Sangar (followed by Colonel Wilkinson), as well as leading to the Isot, Musa Khel, Kakur, and Bozdar countries. In fact all that part of the frontier which lies between Dera Ismail and Dera Ghazi is a network of passes and lateral communications laid out by nature with a regularity (due very much to the peculiar geological conformation of the district) very similar to a scientific system of parallels and approaches. So that we need not look to the Sulimán range as a natural barrier of any formidable description. It has generally a double line of main watershed (the commonest possible geographical feature throughout Afghanistan), with a series of broken, but approximately parallel, minor ridges forming narrow lateral valleys, running about north and south, all parallel to the main formation and to the line of the frontier, and combined into a general system, which is broken through by the main drainage lines in innumerable places; thus roads to the plateau are opened up more or less difficult according to the nature of the gorges and rifts formed by the change of direction of the drainage across the lines of watershed.

West of the Sulimánis is a part of the central plateau, drained chiefly by the Upper Vihowa, consisting of a flattish piece of country partitioned into valleys by narrow and difficult ranges of small altitude, and possessing the same general characteristics as those dividing the drainage of the Bori from that of the Zhob further south. At the head of the Vihowa might easily be found a strong position from which to dominate these endless passes into India, and their continuation westwards into Afghanistan. The valleys of the Upper Vihowa are well supplied with grass and water; cultivation would soon follow a strong government, and develop the natural resources of a really fine country, possessing all the advantages of an excellent climate, but cursed with wild and unsettled inhabitants. Isots, Musa Khel, Bozdars, and Kakurs are all alike in their independence and fierce love of fighting amongst themselves. They are just too far from India to be brought easily under British influence; and form a strong contrast to the people below the Sulimáni ridge, east of it, who are practically British subjects already. Yet their goodwill can never be a matter of indifference to us from the importance of their geographical position.

The districts of Thal-Chotiali and Vitakri, south and south-west of Fort Monro, are already under systematic survey. Even the wild Mari and Bugti hills are gradually being reduced to maps on the usual trigo-topographical system of the Indian survey. It is hardly necessary therefore to refer in detail to such well-known connections

between these districts and India as the Sakki Sarwar, Kaho, and other passes, inasmuch as the occupation of Thal-Chotiali places these passes rather behind our frontier than beyond it. The two great roads to Afghanistan from Jacobabad are, of course, the Bolán and the Harnai route, by which the railway is now being carried to the Pishin. It is, perhaps, as well to remark that these passes originally differed in no very material degree from others north of them in their general characteristics. They were not more open, their gradients were originally much the same from the plains to the plateau; they passed through the same desolate scantily-clad hills, affording the same short supplies of forage and water, as those which lead from the frontier stations of Rajanpur, Dera Ghazi, or Dera Ismail, to the same final destination in Pishin or Kandahar.

These passes differ from one another not in quality, but in degree. Of all of them it may be said with equal truth that their utility depends greatly on the season; grass, fodder, and water may be plentiful at one time, and scarce at another, just exactly as it is on the high lands to which they lead, and whose climatic conditions chiefly govern them. The valleys of the Bori, the Zhob, the Kundil, the Sharán, or the Gomul are alike in this particular. It depends on a vicarious rainfall whether they are barren and destitute of forage, or whether they are well filled with those first requisites of supply—water, wood, and grass. But the Bolán and the Harnai have become great high roads, whilst the passes between them and the Gomul are untouched; and the question concerning them which chiefly interests us at present is whether they could be made useful for military purposes exactly as they are. There can be no doubt whatever that in favourable seasons they could, many of them (quite as many of them, that is, as could serve any general strategical purpose), be made available for the passage of any sort of force that did not include wheeled artillery.

The boundary of Afghanistan does not extend much further south than the latitude of the Bolán. Much fresh information about routes and tribes adjoining its Baluchistan and Persian borders has lately been acquired by the Hon. M. G. Talbot, R.E., who accompanied Sir R. Sandeman's late mission into Southern Baluchistan. Baluchistan has now been thoroughly explored and, to some extent, surveyed, up to the Persian frontier. The Persian surveys of St. John and others have been connected with the Indian system. The importance of Kalát in relation to our direct roads to Kandahar is a question that can better be considered when the survey materials recently collected have been finally put together.

To recapitulate a little: the gradual unravelling of the geographical tangle in Northern Afghanistan, as well as the better comprehension of the resources and communications of the Central Afghan plateau which we now possess, should lead to more certain and definite conclusions as regards the geographical barriers between India and possible invasion from Central Asia. It is clear that we can no longer regard the Hindu Kush between the Bamián, or Irak, and the Baroghél Passes as a formidable barrier except during a few months

in the year, when most of the passes are snowbound. The altitude of the main watershed is less than has been supposed, and the passes across it are many of them surprisingly easy. The cultivation of a friendly intercourse with the Kaffirs cannot but be important to our interests. They are a fighting people, not only able to hold their own against the fanatical Mahomedan tribes which surround them, but quite capable of active aggression on their own part. On the goodwill of the Kaffirs largely depends the utility of the most important pass of all—viz., that between Faizabad (the capital of Badakshán) and Chitral; whilst the peculiar views which they entertain in regarding Europeans as upholding the same religious cause with themselves is an important characteristic which might readily be turned to excellent account. But though the main watershed of the Hindu Kush can never in itself prove a strong line of defence, it need not be supposed that there is *no such line* north of the Khyber Pass. It is not within the scope of this paper to point out the geographical difficulties of the wild regions south of the Hindu Kush, and north of the Khyber. Considered alone, and without any reference to the nature of the inhabitants, they are sufficient to render it inconceivable that any regularly organized force should attempt to penetrate into India that way so long as any other remained open.

Accepting our present frontier line in India as scientific enough for present emergencies, no harm can be done by drawing attention again to its one great defect of want of command over our main line of communication. That a mighty bastion like that afforded by the Affridi and Jowaki hills should be pushed into our territory, almost to the banks of the Indus—a bastion, too, affording such ample and excellent means of being turned to aggressive account in the event of any frontier war, whilst the simple expedient of occupying Maidan (or the Affridi Tirah) would just reverse the position, and give us a dominating power over the Khyber line on the one side and the Kuram on the other, is a defect so palpable, that it can hardly last much longer. Even the present attitude of the Pass Affridis (who are good enough to permit us to ride along our own high road between Peshawur and Kohat only when satisfied with the arrangement of the salt duties, and who have been known to steal the Peshawur Commissioner's horses on that road, with the honest purpose of offering them back to him as a bribe for certain concessions) should be enough to demand that we should keep our communications in our own hands.

The next important point to which the attention of strategists is drawn is the value of the Tochi Valley, or Dawar, route in the event of any future Afghan expedition, and the command offered by a central position on that route over some of the chief highways of Central Afghanistan, as well as its political importance in relation to surrounding tribes. The possible importance of Bannu (or Edwardesabad) as a base, and the necessity of its better connection with the rest of India, is only a part of the question; also the desirability of establishing our influence with the mixed tribes who hold the heads of the many passes crossing the frontier between Dera Ismail and

Dera Ghazi Khan, which spread out into roads over Central Afghanistan, by maintaining a post at the head of Vihowa basin, is another matter for consideration. The natural advantages of climate, so important in maintaining the efficiency of our frontier troops, the political advantages of position with reference to a peculiarly troublesome people, the strategic advantage of turning all these passes and occupying an advanced post of observation, have all to be carefully weighed.

Amongst those who have most deeply studied the temper and quality of Indian troops, and who best understand the erratic and distorted notions about British rule in India entertained by the great mass of the Indian people, who are only very partially represented by the soldiery: as well as the nature of our internal alliances with great Indian Chiefs commanding powerful native armies: the conviction is strong that if India is ever again to be fought for by us it must be *beyond our frontier*, and not on Indian soil. History must not be allowed to repeat itself again on any field of Paniput. Asiatics are ever apt to cast in their lot with the advancing side rather than with the waiting one. They do not understand waiting tactics now any better than they did in the days of Alexander. We can, however, wait well enough till the time to advance arrives; and meanwhile we should leave no stone *unturned*, no corner unexplored of the ground over which we may have to move hereafter; not content with that little knowledge which is dangerous, but aiming at a complete and thorough comprehension of all points of vantage in the great Afghan plateau; securing our information, if need be, with such support as a few advanced positions can give us, and a little more regardless of the comparatively insignificant risk which is officially termed "complications" with frontier tribes.



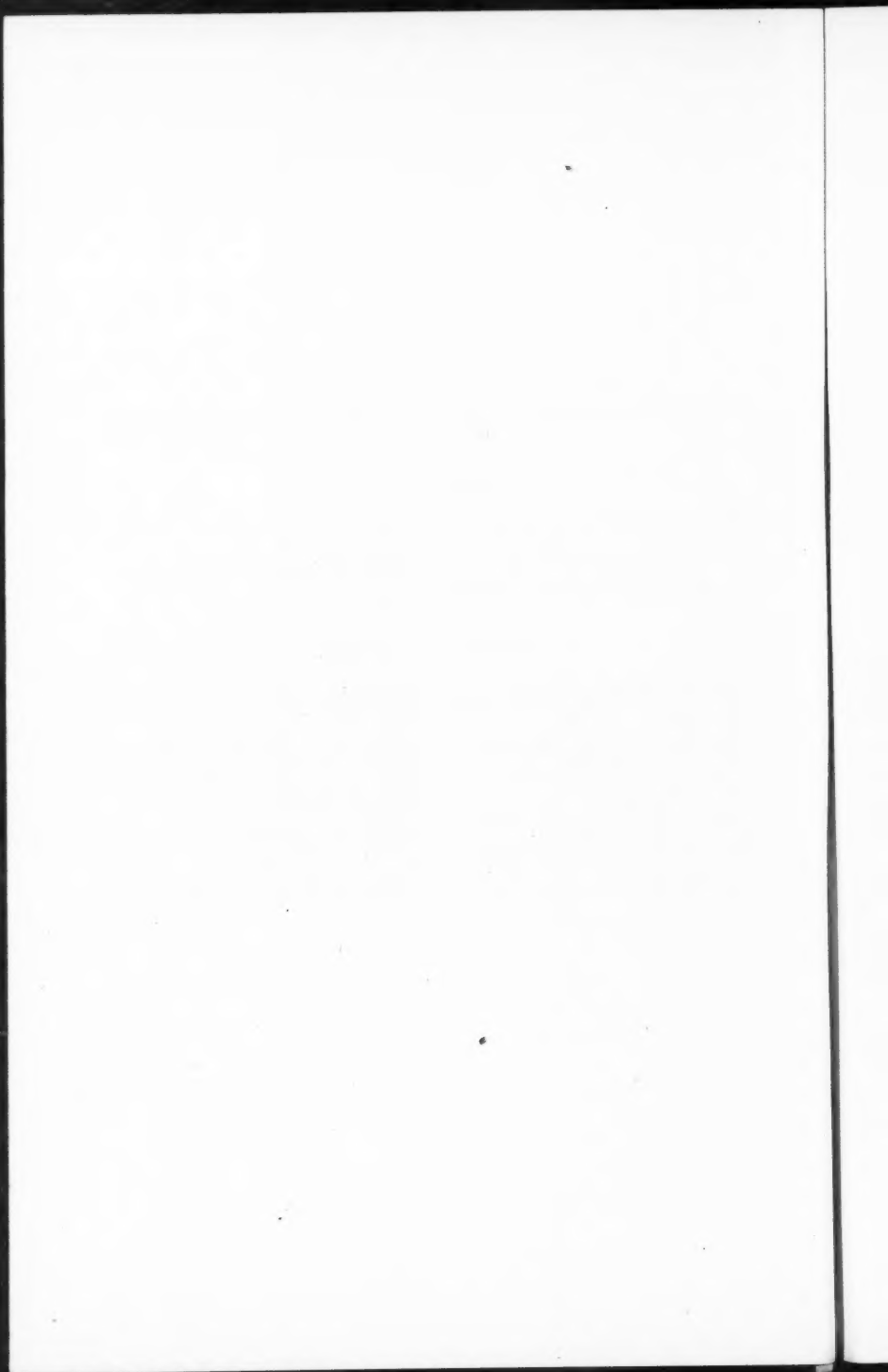
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30th June, 1884.

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## OCCASIONAL PAPERS.

This portion of the Number is reserved for Articles, either Original or Compiled, on Professional Subjects connected with Foreign Naval and Military matters; also for Notices of Professional Books, either Foreign or English.

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### ON INDIRECT INFANTRY FIRE.

From the "Memorial de Artilleria," May, 1883.

By Captain J. C. DALTON, R.A., D.A.A.G.

#### *Translator's Preface.*

THIS is a subject which must necessarily claim a good deal of attention in the present day, for indirect and long-range infantry fire are sure to play an important part in any war that may now arise amongst European nations. I fear that this article will, from its mathematical appearance, frighten a good many readers, but the small amount of mathematical reasoning employed will be found very simple when investigated. It is questionable whether the rules laid down here would have much practical value in the field. I am more inclined to think that they are better suited for the offensive against a large place or camp; still the matter is well worthy of consideration. I am indebted to Lieutenant Askwith, R.E., for kindly looking over the MS. for me, and for adding two notes on them.—J. C. D.

#### *On Indirect Infantry Fire.*

This class of fire is necessary, as with artillery, when the enemy is hidden from view by obstacles and sinuosities of the ground.

But since, with the rifle, only one class of cartridge can be used, the charge cannot be varied in order to obtain the necessary trajectory, and it will not always be possible to cover the ground occupied by the enemy by indirect fire.

It is necessary that one of the various trajectories which are obtained by using the regulation cartridge with different elevations may pass through the desired object without being arrested by the obstacle; and the problem of indirect fire reduces itself to this case, viz., "to determine the elevation with which one should aim at a visible point, chosen as an auxiliary object, in order that the mean trajectory may pass through the centre of the real object."

Let us suppose then that the shooter is at M (Fig. 1), and that Z is the middle point of the definitive object.

Let  $MM_1M_2Z$  be the trajectory of the bullet with an elevation corresponding to a distance  $MZ$ , and D an intermediate point visible from M. It will be

seen that indirect fire against Z can only be employed when the ordinate  $P_1M_1$  of the trajectory which passes through Z is greater than the height  $P_1D$ , which prevents the object being seen.

Given MZ and  $MP_1$  with the levels of M, D, and Z, we know  $P_1D$ . Also from the table of ordinates for the trajectory MZ we know  $P_1M_1$ . Then if  $P_1M_1$  is greater than  $P_1D$ , we can employ indirect fire against Z by aiming at D with such elevation as would place the bullet at  $M_1$ .

Let  $M_2$  be the point where the line of sight MD meets the trajectory  $MM_1Z$ , then the required elevation would be that for the range  $MM_2$ , i.e., practically the range which gives an ordinate  $DM_1$  with an abscissa  $MP_1$ .

The bullet should then follow the trajectory  $MM_1M_2Z$ .

It is obvious that D must be very near the vertical plane through MZ, and also that small corrections for wind, &c., can readily be made by slightly shifting the firing point to one side or the other.

In volley firing, which would usually be adopted for indirect fire, we could take as an auxiliary a line, when the distance from this to the shooter is less than half the perpendicular distance from the line to the real object.

The situation and length of this line will be determined by joining the two points selected as auxiliary objects with the two flank men of the section that is firing. When the above-named distance is greater, and when the auxiliary object is further off than the real one, the section may aim collectively at one point, because the dispersion which results is not great enough to destroy the efficacy of the firing.

A few examples will prove the possibility of establishing rules in certain simple cases for applying with good effect indirect fire from the infantry rifle.

*Example 1.*—We will suppose that for the attack of a fortified position the advanced guard of the attacker from A has occupied the height D (Fig. 2). The defender receives credible information that at Z is massed a considerable force of working parties, which at dusk are to be conducted as far as D provided with tools for constructing batteries. On getting this news the defender, who has previously collected strong protecting sections behind the parapet B, resolves to open with indirect fire by volleys on the working parties massed at Z before they break up into small groups and become distributed along the crest of the heights.

If we possess an exact map we can draw on it the direction of the fire from M to Z.

With the help of a compass we can transfer to the ground the direction of the fire, and select as auxiliary object an avenue of trees near the crest of the height D.

All the distances can be obtained on the map by measurement and by deducing the relative heights of the points M, D, and Z from the contours.

Let us suppose then that having taken from the map the following information—

Level of Z=730 mètres above datum.

„ D=751.5

„ M=738.5+1.5 (height of shooter)

=740

. Distance MZ=1,500 paces.

„  $MP_1$ =800

Then if EZ be a horizontal line through Z

$$GP_1 = EM \times \frac{MZ - MP_1}{MZ} \text{ by similar triangles.}$$

$$\therefore GP_1 = 10 \times \frac{700}{1500} = 4.7 \text{ mètres,}$$

$$\text{and } P_1D = GD - GP_1 = 21.5 - 4.7 = 16.8 \text{ mètres.}$$



Fig. 1.

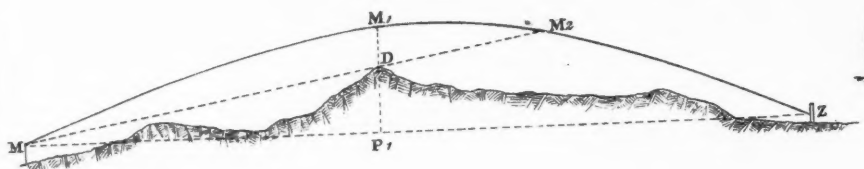


Fig 2.

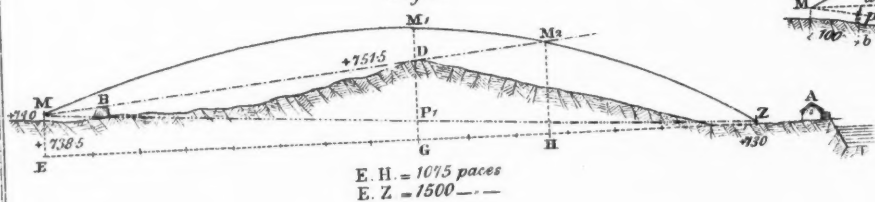


Fig. 3.

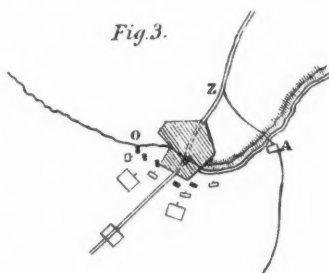


Fig. 4.

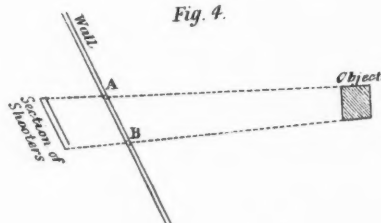


Fig. 3 a.

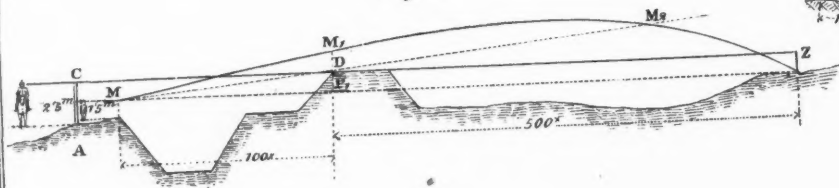
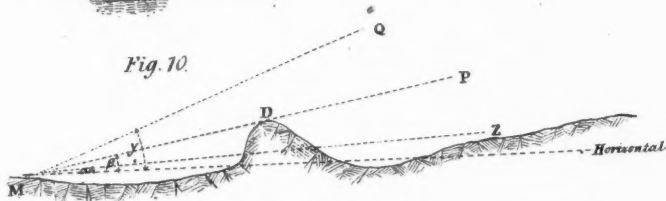
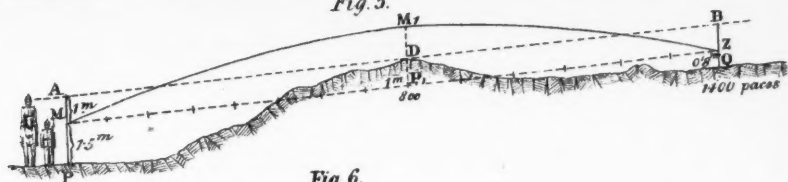


Fig. 10.

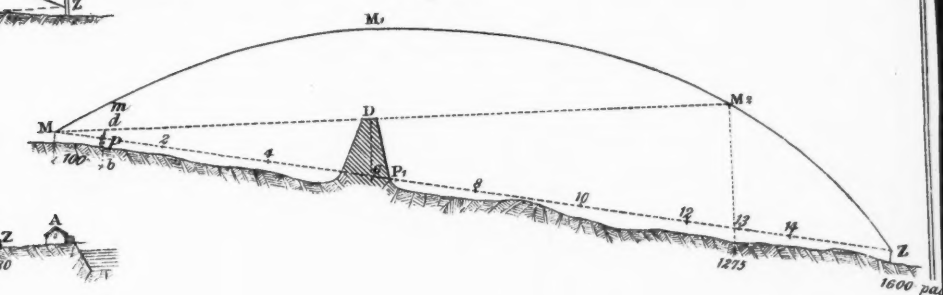




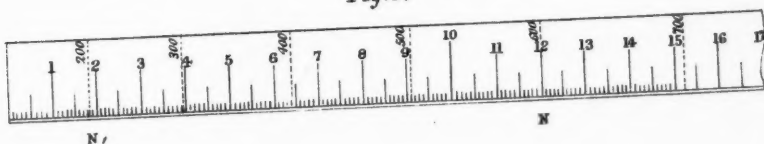
*Fig. 5.*



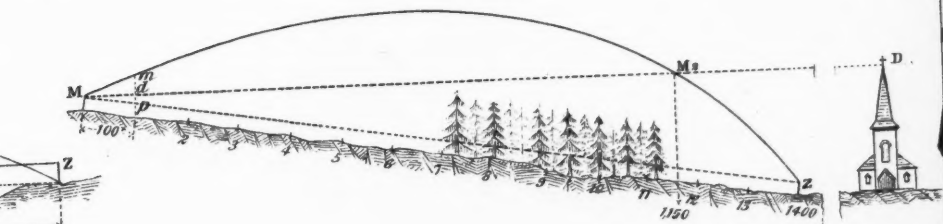
*Fig. 6.*



*Fig. 8.*

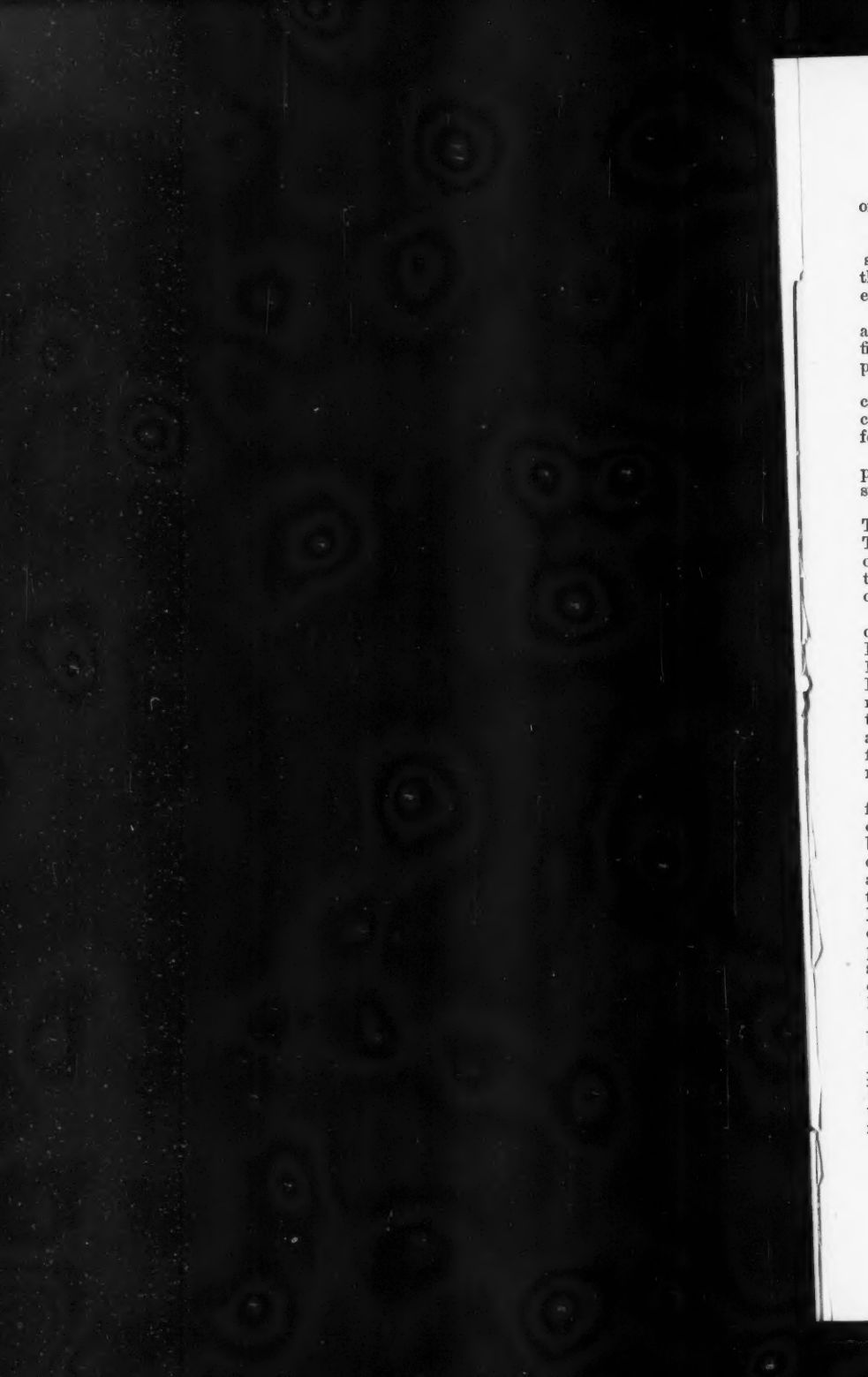


*Fig. 7.*



*Fig. 9.*





According to the tables for the Austrian (Werndl) rifle, the ordinate  $P_1M_1$  of the trajectory of 1,500 paces for the distance 800 paces is 25·8.

Therefore  $DM_1 = 25·8 - 16·8 = 9$  mètres.

By the same tables, the trajectory of which the ordinate is 9 at 800 paces, is 1,075 paces; and the elevation for 1,075 paces is therefore that with which the defender should aim at D in order that the bullet may pass to Z. The enemy's troops at Z would therefore be under fire.

In this example we have imagined to be known all the relations of height and distance between the three points which have to be considered in indirect fire; but this will only occur in the defence of fortresses and positions prepared beforehand.

In campaigning the application of indirect fire must be limited to those cases in which the determination of the heights of the three points in question can be instantaneously known or estimated with sufficient accuracy. The following examples are instanced.

*Example 2.*—The commander of a detachment which occupies a lateral position A (Fig. 3) finds that the bridge by which to pass over an unfordable stream is destroyed.

The bulk of the force has proceeded meanwhile to attack the position O. The enemy abandons O and retreats, concentrating at Z for a fresh resistance. The troops at A do not desecy the enemy on account of a parapet constructed on the opposite bank; but the commander, who, being mounted, perceives them, resolves, in order not to remain inactive at this opportune moment, to open fire on the enemy, who is 600 paces off.

For this object he calculates the elevation necessary, settles on the auxiliary object, and employs indirect fire. In the hypothesis admitted for this case,  $DP_1 = 1$  metre (Fig. 3a); the ordinate of the auxiliary object situated at 100 paces off in the trajectory of 700 paces is  $M_1P_1 = 1·2$  mètres, the distance  $DM_1 = 0·2$  metre, and the trajectory which at 100 paces has an ordinate  $= 0·2$  metre is that corresponding to 200 paces distance, the sight being put up for this range, and the auxiliary object aimed at. The shooting will be sufficiently accurate, because in volley firing at 600 paces the dispersion across the line of fire is 425 paces, and the enemy will be comprehended in it, although there may be a small error.

*Example 3.*—The enemy has occupied an undulation of ground 800 paces from D (Fig. 5). During the attack the commander, who can see a large extent of ground from his horse, warns that a company of the enemy situated 600 paces behind D is about to reinforce the section which is keeping up fire, and decides to employ indirect fire against them. If AB is the visual ray directed at the object,  $AP = 2·5$  mètres (height of eye), the height BQ of the object is that of the infantry soldier; and proceeding as before  $P_1D = 1$  metre, and  $P_1M_1 = 21·48$ . Therefore  $DM_1 = 20·48$  mètres, and the trajectory which at a distance of 800 paces gives an ordinate of 20·48 mètres is by the table 1,375 paces, and the sight should be for that range. Similarly, if in this case the section of shooters were not more than 600, 400, or 200 paces behind the crest, it would result similarly in having to employ elevations suitable for 1,365, 1,350, and 1,300 paces respectively.

However, in the last case of being only 200 paces from the crest, it will be generally preferable to advance rapidly and occupy it, and use direct fire.

If the shooters find themselves at 300 paces from the auxiliary object, and respectively at 500, 600, 800, and 1,000 paces from the definite object, it would be necessary to have the sight up for 400, 500, 700, and 925 paces to obtain the corresponding trajectory, and we can deduce the following practical rule for this case which is by no means rare on a campaign.

*Rule.*<sup>1</sup>—If a mounted commander, or an observer situated at a similar

<sup>1</sup> The following diagram will serve to explain this rule (Fig. 9). If the mounted man

height, discover forces of the enemy which are not seen by the infantry at the same place, the defenders should aim at the obstacle (if they are 300 metres from it) with two different elevations, one corresponding to a distance of 100 metres less than the enemy is distant, and the other corresponding to the distance.

At long distances three different elevations should simultaneously be employed: that for the distance the enemy is supposed to be off, and two others corresponding to 100 metres more and 100 less, and the probability is that the fire will be as effective as if it were direct.

*Example 4.*—On a level and horizontal plane, or on ground rising and falling equally, there is a point occupied by the enemy at a certain distance—for example, the terreplein D of a railroad (Fig. 6), behind which but within the effective range of the rifle there are masses of troops. To determine the command DP, a soldier is placed at *b* at 100 paces from the shooters with the butt of his rifle uppermost, and he raises this until the visual ray from M towards D fixes the position of the point *d* and the height *pd*. This multiplied by the number of hundreds of paces there are to D gives P<sub>1</sub>D, with which the proper elevation can be determined as in previous cases. It is doubtless more simple to have this calculation of the elevation on the height *pd*, which does not offer any difficulties; and it is done exactly in the same way as if we were considering an obstacle at 100 paces off, and in height nearly equal to *pd*.

We proceed in the same manner when in the hypothesis of the ground being regularly inclined, we can choose behind the object an auxiliary point of sight clearly visible, and which can be seen in the plane of fire.

*Example 5.*—Having calculated the distance MZ=1,400 paces from the object Z which is hidden by a copse (Fig. 7), and the elevation of the auxiliary object referred to the distance MP=100 paces, *pd*=1.3 metres, we proceed as in former examples to determine the necessary elevation for the sight. Up to now we have inferred that there are many cases in which the necessary data may be got to enable us to apply indirect fire, and that no great difficulties arise to prevent a commander from familiarizing himself with the conditions and execution of this class of fire, which according to the tendencies of late campaigns appears likely to be largely employed in future ones.

As a result of the two last examples the solution of all the problems here treated may be based on the elevation of the auxiliary object referred to a distance of 100 paces from the place occupied by the firing section, and the lengths of the ordinate of the trajectory corresponding to the same distance. The lengths of these ordinates may be marked on one of those ordinary graduated rulers which fold up into various sizes for convenience, and these will be useful at the same time to take any necessary measures with.

Thus for example, in Fig. 8 is shown a part of the scale of ordinates of the shot at D or Z with the elevation for actual range he should hit the object. If the infantry man shot at D with the same elevation, he would go above by  $\frac{DZ}{AD} \times 1$  metre, thus showing necessity for lowering his sight. Examples 2 and 3 show by how much he ought to lower his sight.—W. B. A.

The conditions of Examples 4 and 5 appear to me to be too *special*, and they are both covered by the practical rule above laid down. We must know the level and range of Z (or slope and range) in any case, so can always reduce to the 100 paces base. If we are allowed the use of an Abney or other field level, I should suggest something of this kind:—Find the angle of elevation (+) or depression (−) to Z (Fig. 10), and call it  $\alpha$ . Select the point D on the line to Z and find the angle to it,  $\beta$  (usually +). Let the elevation for the full range =  $\gamma$ . Then the elevation required would be that for the angle QMP, and  $QMP = \gamma - (\beta - \alpha) = \gamma + \beta + \alpha$ . Look out the corresponding elevation in yards on a table and fire with that elevation.—W. B. A.

trajectory at 100 paces, using the cartridges (model of 1877) of the Werndl rifle.

Each millimètre on the scale represents a centimètre of ordinate, so that in the trajectory—

At 200 paces range the ordinate at 100 paces = 18 centimètres.

" 300	"	"	"	= 39	"
" 400	"	"	"	= 64	"
" 500	"	"	"	= 91	"
" 600	"	"	"	= 120	"





ADDENDUM to the Article on  
THE RUSSIAN ARMY IN 1882,  
which appeared in Nos. CXIX, CXX, CXXI of this Journal.

ALLUSION was made in pages 217 and 235 of No. CXIX to the proposed augmentation of the Russian regular cavalry, the orders for which have at length been issued in an Imperial Decree dated August 23rd, 1883.

Details are given in the "Revue Militaire de l'Étranger," Nos. 593 and 594, from which we borrow the following information.

With the exception of the four regiments of Cuirassiers of the Guard, which will continue as heretofore to consist of four squadrons, all regular cavalry regiments, whether of the Guard or line, will in future have six squadrons, like most of the Cossack regiments.

The additional squadrons were formed on the 13th September, 1883, but the consequent augmentation in men and horses will only be made by degrees, and will not be completed till 1886. The number of regiments will remain the same, namely—

Cuirassiers of the Guard .....	4
Mounted Grenadiers .....	1
Lancers .....	2
Hussars .....	2
Dragoons .....	1
Dragoons of the Line .....	46
Total .....	56

Each squadron will have 64 files divided into 4 sections.

The following table gives the peace and war establishments as they will be when the proposed augmentation has been carried out.

TABLE I.

	Guard.				Line.	
	Cuirassiers.		Lancers, &c.		Dragoons.	
	War.	Peace.	War.	Peace.	War.	Peace.
<i>Combatants.</i>						
Officers—						
Commanding Officer .....	1	1	1	1	1	1
Other Field Officers .....	2	2	2	2	2	2
Captains commanding squadrons ..	4	4	6	6	6	6
Staff .....	3	3	3	3	3	3
Subalterns .....	20	20	24	24	24	24
2nd Captains (for dépôt squadrons)	..	2	..	2	..	2
Total Officers .....	30	32	36	38	36	38

	Guard.				Line.	
	Cuirassiers.		Lancers, &c.		Dragoons.	
	War.	Peace.	War.	Peace.	War.	Peace.
<i>Combatants.</i>						
Non-commissioned officers and privates.						
Mounted—						
Sergeant-majors.....	4	4	6	6	6	6
Sergeants .....	16	16	24	24	24	24
Corporals .....	28	28	42	42	42	42
Trumpet-major .....	1	1	1	1	1	1
Trumpeters .....	16	16	18	18	18	18
Lance-corporals .....	32	32	48	48	48	48
Privates .....	480	480	720	720	720	720
Total .....	577	577	859	859	859	859
Dismounted—						
Assistant riding-master .....	..	2	..	2	..	2
Quartermaster-sergeants .....	6	6	8	8	8	8
Non-commissioned officers .....	5	5	7	7	7	7
Privates .....	41	112	46	133	46	133
Total .....	52	125	61	150	61	150
Volunteers .....	..	4	..	6	..	18
Total non-commissioned officers and privates .....	629	706	920	1,015	920	1,027
Total combatants .....	659	738	956	1,053	956	1,065

*Remarks.*

Regimental commanders in the Guards are Major-Generals, in the line Colonels.

The other Field Officers are Colonels or Lieutenant-Colonels.

The Commanders of Divisions (2 squadrons) on the old establishment are abolished. One of the Field Officers is charged with regimental administration.

One of the subalterns is riding-master.

One of the 2nd Captains is permanently attached to the depôt in peacetime, and both of them on mobilization.

The regimental staff and subalterns are of the following ranks:—

	Cuirassiers.	Other Guards regiments.	Line.
2nd Captains .....	6	7	7
Lieutenants .....	7	8	8
Cornets .....	10	12	12

The Staff Officers are 1 Adjutant, 1 Pay- and Quarter-master, and 1 Officer in charge of the arms.

In war-time dismounted men act as orderlies to Officers and to officials holding relative rank ; in time of peace they are distributed as follows :—

Acting trumpeters .....	6	} 60
Acting farriers .....	6	
Police .....	18	
Orderlies.....	6	
Horse-keepers (to watch the stables when the regiment is on parade), 4 per squadron .....	24	} 73
Cooks .....	7	
Bakers .....	14	
Orderlies to Staff and Regimental Officers .....	52	
Total .....	133	

On mobilization the first 60 serve to fill up the ranks, cooks and bakers are attached to the train, and any superfluous orderlies remain with the families of married Officers.

Volunteers maintain and mount themselves at their own cost.

The assistant riding-masters are sent to the dépôt on mobilization.

TABLE II.

	Guard.				Line.	
	Cuirassiers.		Lancers, &c.		Dragoons.	
	War.	Peace.	War.	Peace.	War.	Peace.
<i>Non-combatants.</i>						
<i>Officials with relative rank—</i>						
Surgeon { 1st class .....	1	1	1	1	1	1
{ 2nd class .....	1	1	1	1	1	1
Veterinary surgeon .....	1	1	1	1	1	1
Accountant.....	1	1	1	1	1	1
Bandmaster .....	1	1	1	1	..	..
Chaplain.....	1	1	1	1	1	1
Total .....	6	6	6	6	5	5
<i>Other ranks—</i>						
Clerks { regimental .....	1	1	1	1	1	1
{ 1st class .....	3	4	4	4	4	4
{ 2nd class .....	..	4	..	5	..	5
Dressers { 1st class .....	1	1	1	1	1	1
{ 2nd class .....	1	1	1	1	1	1
{ squadron .....	4	4	6	6	6	6
Apothecary .....	1	1	1	1	1	1
Assistant veterinaries .....	4	4	4	4	4	4
Acting dressers .....	..	2	..	2	..	2
Acting veterinaries .....	..	3	..	3	..	3
Superintendent of sick .....	..	1	..	1	..	1
Hospital orderlies .....	..	2	..	2	..	2

	Guard.				Line.	
	Cuirassiers.		Lancers, &c.		Dragoons.	
	War.	Peace.	War.	Peace.	War.	Peace.
<i>Non-combatants.</i>						
Other ranks ( <i>continued</i> )—						
Sacristan.....	1	1	1	1	1	1
Armourer-sergeant.....	..	1	..	1	..	1
Armourers.....	2	2	2	2	2	2
Farriers, regimental.....	1	1	1	1	1	1
„ squadron.....	..	4	..	6	..	6
Master saddler.....	..	1	..	1	..	1
Saddlers.....	..	5	..	6	..	6
Cutter.....	..	1	..	1	..	1
Fitter.....	..	1	..	1	..	..
Tailors.....	..	20	..	20	..	6
Regimental transport.....	4	4	6	6	6	6
Total.....	23	69	28	77	28	62
Total non-combatants.....	29	75	34	83	33	67
Combatants.....	659	738	956	1,053	956	1,065
Non-combatants.....	29	75	34	83	33	67
Grand total.....	688	813	990	1,136	989	1,132
<i>Horses—</i>						
Chargers of Officers and officials....	4	..	4	..	38	37
Troopers.....	612	577	902	859	902	859
Draught horses.....	..	8	..	12	..	12

*Remarks.*

The following non-combatants are transferred to the dépôt on mobilization :—

Clerks.....	5
Acting dressers.....	2
Acting veterinaries.....	3
Armourer-sergeant.....	1
Master saddler.....	1
Saddlers.....	6
Fitter.....	1
Cutter.....	1

The 6 squadron farriers and the 6 tailors join the regimental train. The superintendent of sick and the hospital orderlies, who are increased to 8 when the regimental hospital is open, are detached on medical service as required. The sacristan acts as orderly to the chaplain in the field.

Saddle horses required to complete the establishment on mobilization are obtained by requisition, being allotted as follows :—

To officials holding relative rank .....	4
„ squadron quartermaster-sergeants.....	6
„ transport non-commissioned officer .....	1
„ Officers' orderlies .....	36
<b>Total .....</b>	<b>47</b>

The composition of the regimental trains in war-time is not yet quite decided upon, and will be the subject of a future Decree. It is, however, intended that the following dismounted non-commissioned officers and privates, combatant and non-combatant, shall be conveyed on the wagons of the regimental train.

Regimental quartermaster-sergeants .....	2
Clerks .....	5
Dressers .....	3
Assistant veterinary .....	1
Armourers .....	2
Regimental farrier-major .....	1
Orderlies .....	4
<b>Total .....</b>	<b>18</b>

Spare horses of the regimental train will moreover be allotted to the following :—

Squadron dressers .....	6
Assistant veterinaries .....	3
<b>Total .....</b>	<b>9</b>

The following table shows the progress which it is proposed to make annually in attaining the establishment, which, as we have said, is to be completed by 1886.

TABLE III.—*Peace Establishment of a Line Cavalry Regiment with 6 Squadrons.*

	1883. 6 squadrons. 48 files.	1884. 6 squadrons. 56 files.	1885. 6 squadrons. 56 files.	1886. 6 squadrons. 64 files.
<i>Combatants.</i>				
Officers .....	36	36	36	38
Non-commissioned officers and privates—				
Mounted .....	667	731	795	859
Dismounted .....	137	150	150	150
Volunteers .....	18	18	18	18
<b>Total combatants.....</b>	<b>858</b>	<b>935</b>	<b>999</b>	<b>1,065</b>
<i>Non-combatants.</i>				
Officials with relative rank...	5	5	5	5
Other ranks .....	82	76	62	62
<b>Total non-combatants...</b>	<b>87</b>	<b>81</b>	<b>67</b>	<b>67</b>
<b>Grand total .....</b>	<b>945</b>	<b>1,016</b>	<b>1,066</b>	<b>1,132</b>

		1883. 6 squadrons. 48 files.	1884. 6 squadrons. 56 files.	1885. 6 squadrons. 56 files.	1886. 6 squadrons. 64 files.
Horses—					
Chargers	{ Officers .....	34	34	34	34
	{ troopers.....	667	731	795	859
Draught horses .....		12	12	12	12

TABLE IV.—*Showing the Strength of the Cavalry, exclusive of Cossacks, as it was in 1881, and as it will be in 1886.*

1881.			
		War.	Peace.
Officers and officials :—			
Combatants .....		1,736	1,736
Non-combatants .....		290	346
Other ranks—			
Combatants .....		40,010	39,964
Non-combatants .....		4,990	4,602
Grand total .....		47,026	46,648
Horses—			
Officers' chargers ...		1,104	1,104
Troopers .....		31,212	31,212
Draught horses .....		3,184	1,000
Total .....		35,500	33,316
1886.			
		War.	Peace.
Officers and officials—			
Combatants .....		1,992	2,104
Non-combatants .....		290	290
Other ranks—			
Combatants .....		50,362	56,182
Non-combatants .....		1,548	3,590
Grand total .....		54,192	62,166
Horses—			
Officers' chargers .....		1,788	1,564
Troopers .....		49,322	46,976
Draught .....		4,800 <sup>1</sup>	656
Total .....		55,910	49,196

<sup>1</sup> The establishment of cavalry regimental trains being as yet not decided upon, this number is only an approximation.

*Recapitulation.**War.*

The establishment of men will be increased in 1886 by—	
Combatants .....	10,608
But decreased by—	
Non-combatants .....	3,442
Net increase—men .....	7,166

*Peace.*

Increase—Combatants .....	16,586
Decrease—Non-combatants .....	1,068
Net increase—men .....	15,518

*War.*

<i>Horses—</i>	
Increase—Chargers .....	18,794
Increase—Draught .....	1,616
Total increase .....	20,410

*Peace.*

Increase—Chargers .....	16,224
Decrease—Draught .....	344
Net increase .....	15,880

*Reorganization of the Cavalry Depôts.*

The old organization of the cavalry depôts is described in Part III of the article on the Russian Army, page 636, No. CXXI of the Journal. By the Decree of 23rd August, 1883, the following alterations were made. In place of the "cavalry depôt brigades," each of which provided for two cavalry Divisions, "cavalry depôt-cadre brigades" are to be formed, each of which will contain two "cadres," corresponding to Divisions, the said "cadre" comprising three or four "sections," according to the number of regular cavalry regiments in the Division; in the great majority of cases three. The "cadre-brigade," therefore, as a general rule, will consist of six "sections."

The guard "depôt-cadre brigade" will be an exception, as it will comprise three "cadres" the first for the four regiments of Cuirassiers, the second for mounted Grenadiers, for one regiment of Lancers, and one of Hussars, the third for the Dragoons, for one regiment of Lancers, and one of Hussars. The "brigade" will thus consist of ten "sections."

The "depôt-cadre brigade" of the Caucasus is again an exceptional formation, the first section of the Dragoon regiments forming one "cadre." The new system will be introduced gradually, so as to be completely in operation by the 13th September, 1886, or as soon afterwards as possible. The transformation of the "depôt squadrons" into "sections" will commence at once, and the "sections" of the Guard regiments will be immediately grouped in "cadres," but those of the line regiments will only be grouped together when proper accommodation has been prepared for them.

The existing cavalry depôt brigades will be at once converted into cavalry depôt-cadre brigades, and that of the Guard regiments will be created. During the state of transition "sections" may be commanded by Colonels already on the strength of the depôts, so as to have the advantage of their experience,



vacancies, as they occur, being filled up according to regulation. Captains belonging to the old "depôt-squadrons," and appointed to the new "sections," will have the right of being retained on the strength of their regiment for four years, after which they will be removed from it. When the existing "depôt squadrons" are transformed into "sections" the Commanders will retain their positions, the new regulations as to this grade being only carried out when the "sections" are grouped into "cadres;" on vacancies occurring preference will be given to Officers now acting as second in command to the Commanders of "depôt squadrons."

The cavalry "depôt-cadres" are intended for the following purposes:—

1. In time of peace, to train the remount horses for their respective regiments.

2. In addition to this, to serve in war-time as nuclei for the formation of "depôt squadrons" whose function is to feed the service squadrons with men and horses during the operations. A "depôt cadre" will be commanded by a specially selected Officer of the rank of Colonel or Lieutenant-Colonel, who will have the powers of a regimental commanding Officer. He will be assisted by an Adjutant, a Paymaster (both squadron Officers), a remount Officer, a surgeon, and a veterinary.

A "section" will be commanded by a squadron Officer, assisted by a second in command, and exercising the powers of a squadron leader.

In peace-time one of the two 2nd Captains told off in each regiment to command the "depôt squadron" formed in time of war is detached to the corresponding "section" of the dépôt to assist its commander and to prepare himself for the duties which he will have to perform on mobilization. Each of the two 2nd Captains in turn will be detached in this manner for a year, at the end of which time he will return to his regiment with the remounts, his comrade then relieving him, and taking back to the dépôt the detachment which has brought the horses to the regiment.

"Depôt-cadre brigades" will be commanded by Major-Generals, who will have the powers of Generals of Division, and whose duty it will be not only to superintend generally the training of men and horses in the cadres under their command and the supply of reinforcements in due time to the service squadrons, but also to look to the manner in which the remount Officers perform their duties by requiring periodical reports from these gentlemen, and by inspecting the remount dépôts whenever necessary, reporting to the Inspector-General of Cavalry, and in urgent cases to the General commanding the district.

The brigade staff consists of an Adjutant, a squadron Officer, two clerks (five in the Guard Brigade), and an armourer.

Commanders of "depôt-cadre brigades" are appointed directly by the Emperor, and commanders of "cadres" by Imperial Decree. The lower grades in the "cadres" will be filled from the respective regiments, junior Officers being selected. Retired and reserve Officers below the rank of Captain may be appointed to the "depôt cadres," being first however placed on full pay of their regiments. All the "depôt cadre" Officers below the rank of Captain are retained on the strength of the regiments from which they are detached, being shown as permanently "on command." When promoted, they are shown as supernumeraries in the regiments to which they belong.

All other dépôt Officers are unattached.

Subalterns retain for three years the right to rejoin their regiments should they wish it. Captains attached to a dépôt can only be appointed to field rank if appointed to the command of "cadres."

As regards the men, "depôt cadres" are recruited in the same manner as other corps, the preference being, however, given to men accustomed to the care of horses, and especially to those who have been employed in stud establishments or by horse-breakers.

TABLE V.—*Establishment of a "Cavalry Dep't Cadre."*

	Guard.		Line.	
	Cadre of 3 sections.	Cadre of 4 sections.	Cadre of 3 sections.	Cadre of 4 sections.
<i>Combatants.</i>				
<i>Officers—</i>				
Commander (Colonel or Lieutenant-Colonel) .....	1	1	1	1
Commanders of sections <sup>1</sup> .....	3	4	3	4
Assistants to ditto .....	3	4	3	4
Adjutant <sup>1</sup> .....	1	1	1	1
Pay- and Quarter-master <sup>1</sup> ....	1	1	1	1
Total Officers .....	10	12	10	12
<i>Other ranks—</i>				
Sergeant-majors .....	3	4	3	4
Quartermaster-sergeants .....	3	4	3	4
Sergeants .....	3	4	3	4
Corporals .....	15	20	15	20
Remount-sergeant .....	1	1	1	1
" corporals .....	2	3	2	3
Trumpeters .....	3	4	3	4
Lance-corporals .....	18	20	18	24
Privates .....	183	208	189	252
Rough-riders for remounts ....	12	16	12	16
Total .....	243	284	249	332
Total combatants .....	253	296	259	344
<i>Non-combatants.</i>				
<i>Officials with relative rank—</i>				
2nd class surgeon .....	1	1	1	1
Veterinary .....	1	1	1	1
Total .....	2	2	2	2
<i>Other ranks—</i>				
Clerks, 1st class .....	2	2	2	2
" 2nd class .....	3	4	3	4
Dressers, 1st class .....	1	1	1	1
" 2nd class .....	3	4	3	4
Assistant veterinary, 1st class ..	1	1	1	1
" 2nd class ..	2	3	2	3
Farriers, 1st class .....	3	4	3	4
" 2nd class .....	6	8	6	8
Saddlers and carpenters .....	6	8	6	8

<sup>1</sup> Of whom two in each cadre are Lieutenants, of the remainder half being Captains and half 2nd Captains.

	Guard.		Line.	
	Cadre of 3 sections.	Cadre of 4 sections.	Cadre of 3 sections.	Cadre of 4 sections.
Other ranks ( <i>continued</i> )—				
Tailors .....	3	4	3	4
Hospital orderlies .....	2	2	2	2
Military train .....	3	4	3	4
Total .....	35	45	35	45
Total non-combatants ..	37	47	37	47
Grand total .....	290	343	296	391
Horses—				
Troopers { cadre .....	24	24	24	32
{ remounts .....	258	232	270	360
Draught .....	3	4	3	4
Total horses .....	285	260	297	396

*The Supply of Horses for "Dépôt Cadres."*

In Russia all horses for military purposes are bought by remount Officers specially chosen for that duty. Under the old system they formed part of the staff of the dépôt brigade, their number, as well as that of the remount detachments under them, being shown at pp. 636 and 637 of Part III of the article on the Russian Army; under the new system they are on the strength of the "cadres," as shown in Table V. Remount Officers collect the animals which they purchase in a remount dépôt, the situation for which they select with the consent of the civil authorities. The village in question provides stables for the established strength of the dépôt, and pasturage for 50 per cent. over that strength.

The annual allowance for remount purposes is paid a year in advance by the commanders of dépôt brigades to the remount Officers, who expend the money as they think fit, without being required to render any account. The price allowed for Cuirassiers is 300 roubles per horse, for other Guard regiments 203 roubles, and for the line 125 roubles.

The Inspector-General of Cavalry appoints the time at which the remount Officers are annually to deliver the number of sound young horses for which requisition has been made beforehand. The normal requirements amount to 10 per cent. of the establishment, with, in addition, four horses per section to make up for loss by accident, and four horses for the instruction of recruits; extra demands, however, have also to be met to replace horses allotted to Officers and to make good casualties; the requisitions for such purposes being sent in annually on 13th June by commanders of cavalry Divisions to those of "dépôt-cadre brigades."

Should a remount Officer not supply the required number of horses at the time appointed, the commanders of dépôt-cadre brigades may order the number deficient to be bought by special agents, the price thereof being deducted from the funds furnished to the remount Officer. Remount horses are examined successively by commanders of sections, of cadres, and of dépôt-cadre brigades, being finally passed into the service by a special

commission. In case of casualties between the period of purchase and of delivery, brigade commanders may order other horses to be bought in lieu, paying for them out of the forage fund. The special commission for passing the remounts is appointed by the Inspector-General of Cavalry, and consists of a General, a Cavalry Brigadier, and the commander of the "depôt-cadre brigade."

Any animals found unfit for the service are cast, and at once sold, being replaced, if possible, by other purchases. If, however, this cannot be done in good time, notice of the deficiency is given to the commanders of cavalry Divisions, so that a corresponding reduction may be made in the number of troop horses cast. The commission reports direct to the Inspector-General.

The horses on arrival at the regimental headquarters are inspected by commanders of Divisions, brigades, and regiments, but these Officers have no power of rejection.

*Formation of "Depôt Squadrons" in Time of War.*

On mobilization, each "section" will be required to organize 2 "depôt squadrons," each of 80 files, besides maintaining in excess of this establishment 135 combatants and 45 non-combatants for the purpose of creating a third depôt squadron and for making up the clothing. The men for this formation will be obtained from the reserve, and the horses by requisition. In order to facilitate this operation, each depôt cadre is reinforced from its corresponding regiment on mobilization by the transfer of 2 2nd Captains (one of whom already attached), 2 assistant riding-masters, by all combatants who are in excess after the mobilization of the regiments is completed, 2 clerks, and 8 other non-combatants. The depôt squadrons will despatch detachments to their regiments as required, holding the first in readiness to march within a fortnight of mobilization. The 3rd "depôt squadron" will only be formed on the receipt of special orders. The clothing, arms, &c., issued for the use of "depôt squadrons" are kept till required in the dépôts of the Commissariat and of the Artillery. If necessary, whole "depôt squadrons," instead of detachments, may be sent to reinforce regiments on active service.

The "depôt cadres" will continue to furnish remounts to their respective regiments and to break in young horses for them throughout the war, the same as in time of peace.

TABLE VI.—*Establishment of a Depôt Squadron.*

<i>Combatants.</i>		<i>Non-Combatants.</i>	
<i>Officers.</i>		Clerks .....	2
Squadron Commander (2nd Captain) .....	1	Dresser .....	1
Subalterns .....	4	Assistant veterinary .....	1
	—	Saddler .....	1
Total Officers .....	5	Farriers .....	4
	—	Cook .....	1
<i>Other ranks.</i>		Military train .....	1
Sergeant-major .....	1		
Sergeants .....	4		
Corporals .....	7		
Trumpeters .....	3		
Privates .....	165		
	—		
Total men .....	180		
	—		
Total combatants .....	185	Total non-combatants .....	11

Combatants .....	185
Non-combatants .....	11
Grand total .....	196

In addition to the above, each depôt section maintains :—

Dismounted combatants :—				Horses.	
Non-commissioned officers.....	} From the re-serves	{ ..	12 5 120	Officers' remounts.....	11
Trumpeters.....				Squadron Officers' chargers....	5
Privates .....				Combatants .....	175
				Spare horses .....	20
Non-combatants:—				Draught ditto .....	2
Farriers .....	} From the re-serves	{ ..	6 9 18 3 6 3 3		
Tailors.....					
Shoemakers.....					
Cooks .....					
Bakers .....					
Train soldiers ..					
Assistant dressers					
Do. veterinaries	} From the re-giments	{ ..	6 6 3 3 3		
Armourer-sergeants					
Saddlers .....					
Cutters .....					
Total .....			201	Total.....	213
Draught horses .....			3		

TABLE VII.—Comparative Strength of Cavalry Depôts in Peace and War under Old and under New Systems.

	Peace.		War.	
	Depot squadrons. Old system.	Depôt cadres. New system.	Provisional squadrons. Old system.	Depôt squadrons. New system.
Combatants .....	11,328	4,832	29,008	28,280
Non-combatants .....	2,864	686	1,344	4,938
Total .....	14,192	5,518	30,352	33,218
Horses .....	6,944	5,544	20,480	23,856

The advantages of the new system are supposed to be—

1. Economy, arising from a reduction of the peace establishments.
2. Greater solidity in the organization of the depôt squadrons in war-time.
3. Better control over the operations of the remount Officers.

L. G.

## THE MEDITERRANEAN FROM A MILITARY POINT OF VIEW.

Précis of a Lecture recently delivered in Germany, by Major Wachs,  
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IF, for the purposes of military discussion, we divide the sea into a western and eastern basin, drawing a line through Italy, Sicily, and Malta, the latter portion is undoubtedly the most interesting and important, containing as it does the very centre of gravity of the whole. Not only in modern times have the eastern coasts had this superior importance assigned to them; the Grecian invasions were directed eastward, Alexander's great expedition, the Crusades and the fleets of Venice and Genoa. But in our times a work has been completed which is destined to deal a vital blow to the machinery of the world, and to cause a gravitation towards the south-east of the basin—a work whose effects are taking unthought-of dimensions, and throwing into the scale political, commercial, and military interests previously unknown. The Suez Canal, which compresses the entire Mediterranean into one narrow line, has become a powerful magnet, the pole of European politics.

Before considering the military and strategical conditions of the coast lands of the Mediterranean, I must first call attention to a peculiarity of this sea, one that distinguishes it from all other great seas, and gives it the character of an inland sea. Unlike all others, it has but few and narrow entrances, two natural, from the Atlantic and Black Sea, and one artificial, but not less important, from the Indian Ocean; the former two commanded by works of great strategic importance, the latter passage not fortified, but, as we shall presently see, strategically covered. The first and last are in British hands, and the possession of the important island of Cyprus has brought the English close to the passage to the Black Sea.

Beginning with Tripoli, the longed-for Italy has for its capital is of an importance that should not be undervalued, notwithstanding the sterile and poorly populated country adjacent. It occupies the most favourable geographical point on the north coast of Africa between the Egyptian and Tunis frontier, being the aim and magazine of the caravans coming through the Sahara from the south; an island so to speak laved by the waves of the desert and Mediterranean, and also a natural fortress, to say nothing of the old high walls which surround it and the six bastions and well disposed batteries which cross their fire over the harbour.

Next to this come the French Tunis and Algeria. This long stretch of coast line with its good harbours, in conjunction with the south coast of France and Corsica, allows the French not only to share the supremacy in the western basin with England, but to appropriate it entirely and to turn this part into a French sea. So at least dreams the Third Republic.

Morocco assists Spain in separating the Mediterranean from the Atlantic; on her the eye of Spain longingly rests, and she already has several titles of possession, the chief being the port and fort of Ceuta opposite Gibraltar.

<sup>1</sup> This lecture appears in a supplement to the "Militär-Wochenblatt," a periodical under the supervision of the General Staff at Berlin.

The rock of Gibraltar requires no description. Its fortified fronts face south and west, while an attack from the north and east is forbidden by the conformation of the rock. Its works are armed with 2,000 guns. From its high signal-house all ships are announced which pass the Straits (here 12½ miles wide) or wish to put into its roomy bay, an order from the Government closing both. The influence of Gibraltar extends eastwards until it meets the effective sphere of Malta, and westward to Portugal and the west coast of Africa. Undoubtedly it is the most important point in this part of the sea, for Spain possesses only one naval harbour of the first class, Carthage, and the fleet is not strong enough to protect its own coasts against naval forces such as are at the command of France or even Italy. At the present time the idea is mooted in Spain of underbridging the Straits of Gibraltar by a submarine tunnel.

Coming next to French ground the military interest increases, since the Republic is the second European naval Power and its chief colonies border the Mediterranean. Every requisite for solving the Mediterranean question is at hand in the shape of war and transport ships and preparations for embarkation. According to the calculations of Italian naval Officers, France is in a position to embark 70,000 men in her transport fleet at one time. In Toulon and Marseilles everything is actually ready for the simultaneous shipment of several Divisions. In Toulon four Divisions can be embarked rapidly, and in Marseilles eighty large transports can be laid alongside for loading at the same time, and this loading space, now 6½ miles long, is to be increased to 9 miles. In addition, embarkation by boats can be carried out along a stretch of 2½ miles. In ten hours two French Divisions were embarked in the last expedition to Rome.

Corsica, about half way between France and Algeria, and whose western coast is particularly rich in harbours, forms an advanced post, especially against Italy, and might play a great rôle in case of war if the works covering the harbours, especially Bonifazio, were strengthened as is proposed. Opposite Sardinia the island has lately received military organization.

Eastward from France comes Italy, whose importance in this sea arises from its great coast line, quite apart from its position in the middle of the basin, forming with Sicily a bridge which stretches out to within 100 miles of the African coast. Several hundred miles of the coast are suitable for embarkation or landing, and there are thirty secure harbours. Thus it is difficult for Italy to defend her harbours and landing places by coast vessels, and, at the same time, to hold the high sea by a fleet. The Italian naval scheme of 1877 is intended to meet both requirements. The "Lepanto," "Duilio," and "Dandolo," ships unsurpassed in point of strength, armament, and speed, prove that the Italians have not been idle. Already can the Italian fleet look upon itself as superior, as to fighting ships at any rate, to the Austrian, and the colossal armoured ships which the Austrians contemplate building will hardly restore the equilibrium. Without examining the chances of Italy in a war with a maritime Power, we may point to the position of her railways on the east and west coasts, exposed in many places to the operations of hostile fleets, and in some even under fire from the sea. This would seriously hinder mobilization and concentration, and even allow of the isolation of already formed bodies of troops.

The fortification of the harbour of Vado deprives a hostile fleet of a suitable point of support in operations against Genoa, and, as against a French invasion, blocks the very important road and railway along the Riviera.

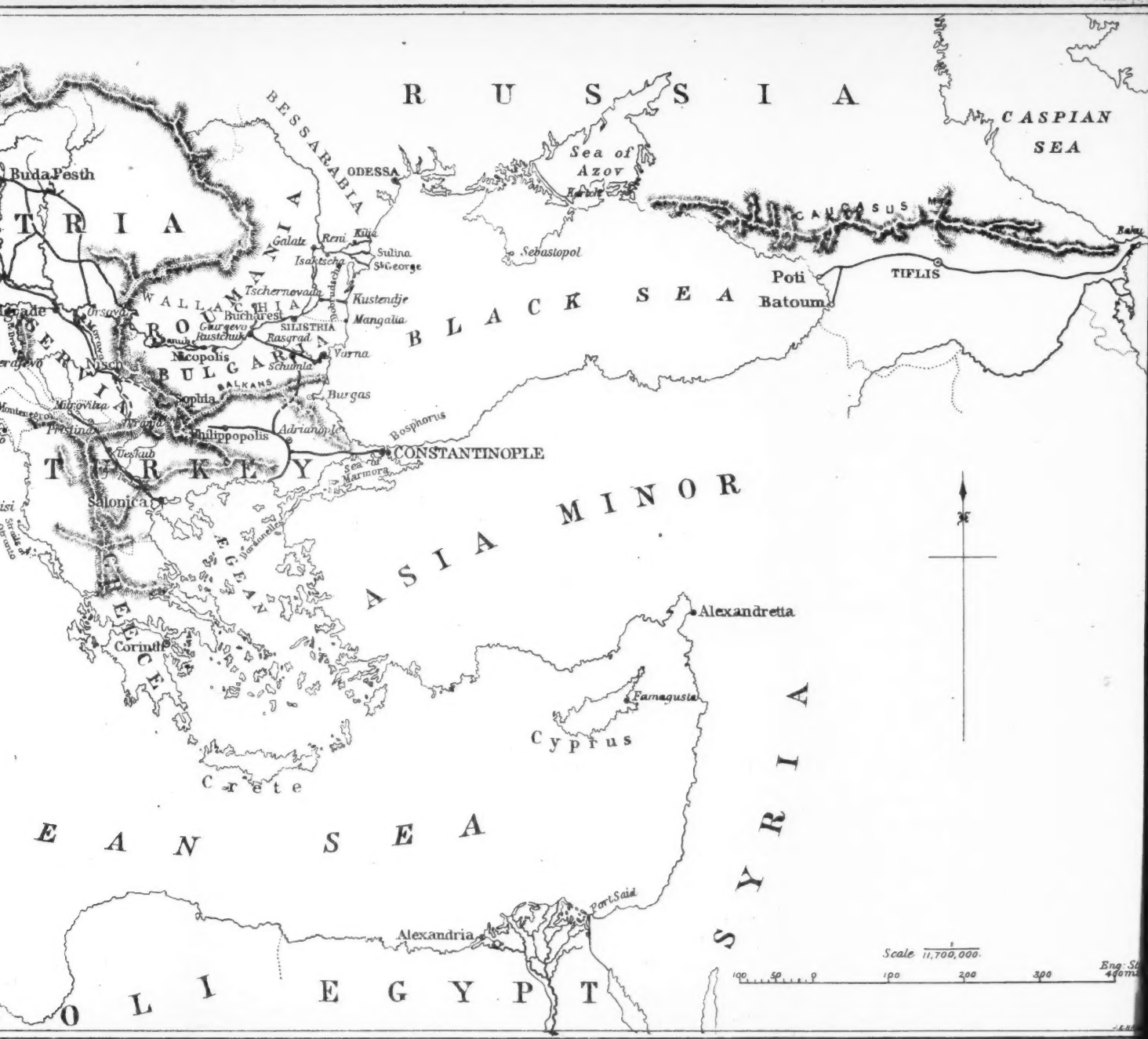
The important harbour of Genoa is as yet but very insufficiently fortified; the defence from the sea would be entrusted to floating batteries.

The roomy naval harbour of La Spezia forms the central point for the fleet, and a sallyport for the defence of the Gulf of Genoa and the Tuscany



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coast ; here are monster guns (100 tons, 45-centimetre) which command the sea to a great distance.

The harbours Livorno, Porto Ferrajo, and Porto Longone are as yet unprotected ; the latter two are points which from the nearness of Corsica would be convenient bases for an enemy's operations. These and Sto. Stefano are to be protected by batteries.

Civita Vecchia, important only from its nearness to Rome, is said to be strong enough to resist a *coup-de-main* ; the same will be the case with the works to be constructed at Naples, whose wide bay could only be made thoroughly secure by very large works.

The Straits of Messina are to be commanded by shore batteries of great calibre, and blocked by torpedoes. A permanent camp is to be formed in Sicily, and bridge heads to secure the passage across. A submarine tunnel to connect the Sicilian and Italian railways is projected.

Sardinia, twenty hours from Toulon, is of exceptional importance. The shipping from the French coast to the Tyrrhenian Sea passes through the narrow Strait of Bonifazio. If the Madalena roads were fortified as proposed, the Italian fleet could from this point more easily and effectively protect the west coast of Italy than from La Spezia.

The strategically important south coast, opposite Malta and Africa, has as yet no naval *point d'appui*. It is, however, intended to turn the harbour of Taranto into a great naval harbour, and fortify it also from the land side. The works, begun in 1881, are to be finished in 1889. The deep basin of Mare Piccolo, about 14 acres in extent, is the naval harbour, and provision and coal magazines, water cisterns, dry docks, and hydraulic cranes are being built. This shows the earnestness of Italy to secure a fortified harbour of refuge and outfit for a fleet operating against the north coast of Africa, which at the same time would watch the Straits of Messina and Otranto.

The east coast of Italy is flat, offers no difficulties to landing, and has no protecting works, not even at Brindisi.

Ancona is the nearest naval harbour, the land works and coast batteries being a central point for operations against hostile forces landed between it and Ravenna.

Venice is protected by Fort Malghera, and other works cover the harbour, which has lately been much deepened. As the chief naval station in the Adriatic it is of great strategic value.

The task of the Italian Navy would be difficult, whether it were to occupy the outposts or to operate with the main body of the fleet. If it could keep the Straits of Bonifazio open for itself and close them to the adversary, the mastery of the Tyrrhenian sea would not be difficult.

Malta, the British naval headquarters and arsenal, and the central point for all the Mediterranean steam shipping, with its fine harbours, protected by works which form one of the strongest fortified places in the world, and an average garrison of 6,000 men, is of even greater importance than Gibraltar, forming the most favourable point of assembly and retreat for the British fleets between the two great basins of the Mediterranean that could possibly be found. It forms the gate to the islands of the *Ægean Archipelago*, and to the Syrian and Egyptian harbours ; it prevents Italy or Austria securing naval supremacy in the basin of the Adriatic, or France in the eastern half of the Mediterranean.

Returning to the mainland, we come next to the Austrian coast, where are the important harbours of Trieste (with its citadel), Pola (a naval harbour of first class), Fiume, Zara (with well commanded harbour), Spalatro (with Fort Grippi), and the excellent and strongly fortified harbour of Ragusa, and Cattaro (with its enceinte and detached forts) ; also the island Lissa, with its well-fortified and excellent harbour.

Turning now east or southward, we come on oriental soil, the Danubian

Orient, of which Moltke said forty years ago that Austria could not view with indifference what occurred in the Balkan Peninsula. This peninsula, between important parts of the Mediterranean and Black Sea, forms a bridge leading to Asia Minor. Its north boundary is formed by the Danube and its tributaries. This river, owing to natural obstructions and other circumstances, is only navigable for ships from Galatz. During its course from Orsova, where it ceases to be Austrian, it passes through Servian, Roumanian, Bulgarian, and, lastly, Russian territory. It is high time Austria made an effort to restore the navigation of the river throughout, so as to connect her provinces with the Balkan Peninsula.

The northern mouth of the Danube, the Kilia, now belongs to Russia, whose preponderance in the Danubian delta will be greatly increased if she succeeds in removing all obstacles (sand-banks, &c.) in that channel, and, by diverting the Danube from the other mouths, renders the Sulina and George Canal impassable for ships. This arm of the Danube, as Hobart Pasha said, will secure all the traffic, and take in flank any Austro-German operations in the Balkan Peninsula. It is reported that Russia intends to form a strongly-fortified harbour at Wontschonk. No one can prevent the Russians wearing armour outside or under their peace clothes, nor hinder them from opening or closing this water-way as they choose. In face of Russia's present anxiety to draw closer to Germany, Austria should take warning. It requires no microscope to watch Russia's slow but methodical increase of warlike means on the periphery of the peninsula; such as new railways and extensions leading towards the Danube, erection and strengthening of fortified camps in the south and south-west, rebuilding of existing works, and enormous transport of *matériel* and guns of heaviest calibre to the places on the Black Sea.

Roumania's position in the Dobrudscha, with regard to Bessarabia, is most unfavourable, since Russia holds the passages of the Danube at Reni and Isaktscha, and the coast between the mouths of that river and Mangalia, the future harbour of the Dobrudscha, has no protection against a hostile landing. She is still more exposed as regards Bulgaria, as is seen on comparing the unprotected line from Mangalia to the Danube with the fortified camps of Schumla and Rasgrad. In the south-west Silistria stands like Damocles's sword over the head of the Dobrudscha. There is as yet, too, no secure communication with Wallachia, so that troops in the Dobrudscha could be isolated and attacked on three sides, would have no strong place as a *point d'appui*, and their retreat could be threatened by monitors and gunboats. Jealous of her new sovereignty Roumania seriously contemplates escaping (at any rate from a commercial point of view) from Russia's iron embrace by cutting a ship canal from Kustendje to Tschernovada, which would create a new situation in the Lower Danube, and reduce the passage from the Danube to the Black Sea from 372 to 52 miles. When, therefore, the east of the peninsula is again in flames, this waterway would at once become a two-edged sword.

The influence of the Danube extends to the heart of Europe.

By the last war Russia secured Bessarabia, the Kilia, and Batoum. The value of Batoum, as a harbour and fortress, to which, in spite of stipulations, it has been raised, cannot be overestimated, and Russia might have been content with her gains; but she continues to pursue her traditional policy—to annihilate the Ottoman Empire, and plant the cross on St. Sophia. She knows the commanding value of the Balkan Peninsula, from which a heavy hand can be laid on half the world, and wishes to hold, in the Bosphorus and Dardanelles, the locks leading to the ocean, turning the Black Sea into a Russian lake.

It cannot be said now, as formerly, that owing to climatic and political causes unfavourable to her maritime development, Russia is being, as it were, stifled, as she holds half the Black Sea coast and a good round possession of

great value in East Asia, invaluable to an aspiring maritime Power. Here she has decided to establish a firm base for commercial and maritime purposes, and for military reasons has selected Wladiwostock, which is to be turned as quickly as possible into a strong land and sea fortress. Thus the Russians push on to bathe their Cossack horses on the shores of Salonica.

Returning to the Balkan Peninsula, we observe that the lines of natural defensive positions in this, the southernmost, part of Europe form obstacles to an advance from the north, which constantly increase in difficulty, so that at last Greece can be defended against heavy odds. The most important of the Greek islands is Crete (Candia), placed between three quarters of the globe, and forming a main bridge from Greece to Asia Minor, steep towards Africa, but offering numerous harbours to the Greek seas, which it blockades and commands. This mountainous island could not be held securely without the possession of the White Mountains at its east end.

The northern part of the Balkan Peninsula is naturally divided into three large theatres of war. The first is bounded on the north by the Balkans, west by the Vardar valley, south and east by the *Ægean* and Black Sea. It is weak from a strategical point of view, having no large features except the Balkan passes, which Turkey has failed to occupy, much less fortify. It is doubtful whether the Turkish fleet could prevent a landing and hold the high sea so as to support a strategic scheme of defence; but the ground is well suited to partisan warfare and tactical defence.

The second theatre lies on both sides of the Lower Danube, where the Russo-Turkish wars have taken place. Here, if Russia could mobilize quickly, and the communications are not blockaded against Russian flotillas in the Black Sea, an easier and quicker concentration could be made on the Lower Danube than nearer Austrian territory.

Russia can quietly assemble her troops by rail near the harbours in the Black Sea and Sea of Azov, and when the Caucasian Isthmus is bridged by the railway from Baku by Tiflis to Batoum, troops can be rapidly brought westward. As troops can be better moved by fleets than by rail, and ships can already get up the Danube as far as Galatz, Russia has a great advantage. If the railway Kustendje—Tschernovada is not of great value, that running in the important military line Varna—Schumla—Rustchuk—Bucharest must be particularly noticed. These strong places with Giurgevo and Silistria render this region strategically important. From Schumla, excellently situated in its centre, good roads lead to the sea, the Danube, Sophia, Burgas, Philippopolis, Adrianople, and Constantinople.

In spite of the Treaty of Berlin, the fortress of Varna,<sup>1</sup> Schumla, Rustchuk, and Silistria still exist, and without further improvement would play an important part in case of hostilities. The space enclosed by them supplies an equally good defensive or offensive position, covers or threatens a passage of the river above or below, secures the deployment of troops landed at Mangalia, Varna, or Burgas, and threatens the left flank of an enemy marching from the north-west on Constantinople, as well as the railway thence to Philippopolis, which will shortly be carried on to Vienna.

The third theatre is bounded on the east by the northern part of the Morawa. The possession here of Bosnia and the Herzegovina, now well provided with roads, is of great value to Austria, but the ground is suited only to small (partisan) operations, and the fate of nations could not be sealed here by a few decisive strokes. The excellent place of assembly for troops formed by the Valley of the Drina and the very strong defile of the Danube Valley from Belgrade to Nicopolis must be especially noticed. The occupation of Bosnia and the Herzegovina, however, gives no commanding military position in the peninsula to Austria.

<sup>1</sup> Varna is about 20 hours' steam from Odessa, 21 from Sebastopol, 31 from Kertsch, 48 from Batoum.



As to the recent consent of Turkey to connect her railway system with the Austro-Servian, Austria, for commercial and military reasons, wishes to join the system by a line from Ueskub to Vranja, the latter thus being strategically an important saltpoint for Austria to the Vardar Valley and the sea, while Turkey wishes the line to connect Vranja with Pristina, which route would be much longer and very difficult for Austrian columns. Whatever lines be ultimately adopted to connect Austria with Turkey, Austria's eastern mission will be greatly facilitated, and the peninsula will become of the highest strategic importance. It is to Austria's, and indeed Germany's, well-understood interest to make Turkey more capable of resisting the disintegrating influences at work in the peninsula itself, as well as the mighty flood swelling up against her from without.

The southern part of the peninsula, Greece, is rich in well-sheltered harbours. Greece will increase in military importance when the canal at Corinth (separating the Peloponnesus from the mainland) is finished in 1886, from which work Austria will greatly benefit, her ships from the Adriatic to Salonica and Constantinople saving 185 sea miles.

Salonica, the second port of European Turkey, from its geographical position and good harbours, has a future, and, as the terminus of the railway from the north, is of great commercial and military interest; it will probably be the connecting point between the Balkan Peninsula and the countries of the Mediterranean and Black Seas, and through the Suez Canal with the further east.

Turning next to the Sea of Marmora, although Napoleon's dictum is not as true now as when it was spoken ("he who rules at Constantinople holds the master-key of the world"), since the Suez Canal has shifted the central point in the Levant to Egypt, Constantinople must ever be an important position so long as the Sea of Marmora remains the only connection between the two great seas. The fortunate possessor of the bridge head between Europe and Asia Minor will always powerfully influence, in a military, maritime, and political sense, the course of events in the Levant.

Passing along from the Sea of Marmora by the east coast of Asia Minor, with its islands and harbours so favourable for commerce or warlike purposes, to the south coast, we complete the boundary of the Mediterranean at the mouth of the Suez Canal.

The unexpected plays a greater rôle than formerly, and as the French really meant that "*la République c'est la paix*," it was easy for the English to checkmate France on the Suez Canal. They succeeded luckily in establishing their prestige in the Arab world (for Arabs camp on both sides of the canal, and the inhabitants of Egypt boast falsely of being Arabs). The old bridge-fight, as it might be called, is for the present over. The past, justice, treaties, customs, and religion draw Egypt to Turkey, the force of arms to Europe. Egypt may be termed a strategic citadel, the influence of her commanding position being felt in three quarters of the globe and on two seas, and the possessor of this country, if powerful, could, at a favourable moment, lay hands on half Asia and Africa, and at the same time influence the whole south of Europe. From this giant fortress Syria, Arabia, and Tripoli are glacis-like seen into and commanded; it would support the development of influence in the Lower Euphrates countries, so commanding the road to India, and from the Upper Euphrates its influence would be felt in Asia Minor, and so come in contact with that of Russia. For England, Egypt means the key to the road to India; while it is next door neighbour to the African possessions of France, notwithstanding the transparent wall between them. Further, the English have in view to command the trade of Central Africa from the Upper Nile, and to counteract French efforts on the Congo; this is indeed but the beginning of future complications.

The Syrian coast resembles a curtain, of which the northern extremity of

Egypt and Cyprus form the bastions. This curtain is the military and commercial basis for the Asiatic countries in rear.

Cyprus, owing to its flanking position on the road to India, is as necessary to England as Gibraltar and Malta, and will form a good base for military and naval operations in the east basin as soon as a practicable deep-water harbour for war ships is completed; without it England had no secure hold (coaling station, &c.), in the Levant.

[Here follows a minute description of the island.]

The Venetians, with remarkable military sagacity, recognized the importance of the port of Famagusta, the citadel which strategically commands the island and the neighbouring seas. The harbour could easily be made 1 English mile long by  $\frac{1}{2}$  mile wide, and deep enough for the largest ships. As a fortress it could be made an eastern Gibraltar. A most important fact too, one that the English with their consciousness of naval supremacy are apt to forget, is that the neighbouring country forms a rich source of supply for a fortress in Cyprus, and the protection of her colonies in time of war might necessitate some points being left to take care of themselves. England appears not to have recognized the high strategic value of the island, and the old fortifications are utterly unsuited to present requirements. The possession of Cyprus and the position in Egypt offer incalculable military advantages; for who would dare to attack Egypt from the sea so long as Cyprus is in British hands? What fleet could hope to cruise on the Syrian coast when threatened from Cyprus and Egypt?

Cyprus is not only a covering outwork to Egypt, but to a great extent paralyzes the dangerous position of Candia. Port Said, Alexandria, and every point on the south coast of Asia Minor are within a day's reach of it. Here England has gained a fulcrum from which she can work the lever in any direction in the Levant.

The silent but not less energetic struggle which has long been going on between Russia and England to establish secure lines of advance to India contributed to the seizure of Cyprus, for England contemplates creating a new line from Alexandretta through Mesopotamia (the real centre of gravity of future Asiatic policy) to the Persian Gulf, and Cyprus covers Alexandretta from the sea. As Syria is protected by Cyprus and Egypt, so on the other hand England defends India in Syria; more, the Syrian coast is the true military and commercial basis for the north-west Asiatic region.

The Porte, which has only too plainly learnt what is the meaning of a British sea road to India, will certainly try as long as possible not to provide the paving stones for an overland route there.

For a long time English Generals and politicians have pictured to themselves this overland route, by which they hope to stop the advance of the Russians from Armenia and to close the Euphrates region to them, and yet they forget that Russia is already at the source of that river, and is ever extending her boundaries southward, and that the military road alluded to loses its strategic value as soon as it is really threatened.

On the other side England deftly makes use of India as a base for an advance to the north-west, as shown by the steamers on the Shat-el-Arab, Tigris, and Euphrates, and the occupation of the important point of Mohammerah.<sup>1</sup> The English flag waves too in the Island of Kishem,<sup>2</sup> which com-

<sup>1</sup> Mohammerah (Mohamrah) is a town on the Hafar, a cut connecting the Kuran river and the Shat-el-Arab, and commands the trade on the Tigris and Euphrates. It belongs to Persia (since the Persian war), but is occupied by Arab tribes only.—TRANSLATOR.

<sup>2</sup> There was formerly a coaling station at Basadore. The Indian Government has one at Bussorah, and the Euphrates Company has a station at Maaghil (in Turkey) which is British property, three miles above Bussorah.—TRANSLATOR.

mands the road from Ormuz ; and a railway is being constructed from Multan by Kelat and Pura to Bushire on the Persian Gulf.<sup>1</sup>

All this shows the importance of Egypt and Cyprus, and the field of their influence extends to England's latest moral acquisitions and strengthens them.

At the same time observe how intensely absorbed Russia is in preparing *her* overland route to India. Already we hear the steam whistle in Örenberg ; the Caucasus is being pierced so as to reach Tiflis by road ; the line Poti—Tiflis—Baku has already been mentioned ; the shores of the Caspian have been drawn closer together by steamers ; the railway from Krasnovodsk on the east coast to Kizil Arvad is to be carried on to Merv and Herat. Who is behindhand, England or Russia ?

The British lion will be feared in India only so long as the communication with England is intact. A close observer cannot but have noticed recent warnings of a great coming convulsion in the east, but the wars near the Mediterranean betoken more than local forces at work ; they vibrate through three quarters of the globe, in all of which England has important interests, and every change affects her deeply. Hitherto English politicians have taken a masterly view of the absolute necessity of keeping every part of the chain of communication with India complete. All the commanding strategic positions in the Mediterranean are in British hands.

Aden, with its garrison of 5,000 men, is a second Gibraltar as regards form, position, and military importance, and is equally secure from the land side. It would be madness to attempt to storm the place. In conjunction with Perim it absolutely bars the entrance to the Red Sea. The purchase of Obok<sup>2</sup> gave France the possibility of sharing the command of the roadway through the Red Sea, and a duplicate key to the Suez Canal. The place being close to the Straits of Bab el Mandeb, and the most practicable point of entry into north-east Africa, may possibly have an important military rôle to play shortly, considering the lively state of French colonial politics, and the roads are large and deep enough to hold gigantic fleets. Note, further, the occupation by Italy of Asab Bay in 1881, showing her determination to have a footing in the Red Sea.

Having noticed England's supporting points in the two seas, let us examine the mobile element of her chain of communication with India—the fleet. As long as she is supreme on the sea, so long will the steel thread through the Mediterranean be unbroken. Although the peculiar aptness of the Briton for the sea, and England's large capital, have secured her the preponderance, a new element has now come into play, and the naval engineer is of more importance than the mere sailor ; quantity has taken the place of quality. Still such a nautical spirit pervades England, that in spite of the great efforts of other naval Powers, and the fact that they have to some extent types of ships which tactically and in nautical respects are better than the English ones, we do not consider her hegemony on the sea to be endangered. The maritime highway from Gibraltar to Aden is secured to her all the more surely by the possession at short intervals of safe coaling stations, fortified dockyards capable of repairing even armour-clads, which no other Powers possess. These are highly important places of arms, since coal is an as yet unsurpassed arm in naval warfare. These places and the fleet mutually support each other.

The Suez Canal is a strategic defile, of which Gibraltar and Aden are the strategic closing obstacles from which a good look-out can be kept. The

<sup>1</sup> This is not the case.—TRANSLATOR.

<sup>2</sup> The French have lately occupied Obok with 60 marines and commenced the formation of a coaling station "in view of a war with China," when the neutral harbour of Aden would be closed to them.—TRANSLATOR.

entrance bridges to the Mediterranean from the west and south are in British custody, and the entrance from the Black Sea can be blocked at any moment. But their as yet undisputed right of way has the greatest importance added to it by the fact of their thorough acquaintance with the fighting area. The English ought to insist on maintaining the supremacy of sea, for Wolsey's transfer of the base of operations from Alexandria to the Suez Canal proves what is to be expected of sea transport, which is not bound to roads or dependent on railways.

Although the great advantages of England's position in the Mediterranean have thus been fully acknowledged, she ought to bear in mind that an undisputed and bloodless hegemony in Europe is impossible, and the contingencies of the future ought to be provided against.

For centuries England and France strove for the mastery in the Mediterranean, and the French flag for several decades has held a position in the French and Tyrrhenian Seas only second to that of the British; Austria, Italy, and Spain claim the third rank; but in the Levant, where her most important interests lie, England has as yet maintained a decided superiority. And although the necessary dislocation of the Navy, owing to its having to occupy positions in all parts of the world which are important on military, political, or commercial grounds, makes a combined employment of England's naval forces most difficult, the geographical position of the Mediterranean reduces these difficulties to the minimum, especially as the British sceptre since the acquisition of Cyprus and the battle of Tel-el-Kebir does not merely float on the sea, but has a firm footing on its coasts, &c. Still England cannot be satisfied with the Suez route. The Mediterranean has too many bays, islands, &c., and if Bonaparte with a cumbrous transport fleet could escape the eagle eye of Nelson, what might not be done in these days of steam?

Such being England's strong position in the Mediterranean and Red Seas, to what extent is it, and consequently her position in the world, threatened? This question is answered by the further one, whether England can hope never to be compelled to maintain her title of possession on dry land by the sword? Such a hope could only prove to be vain, and if she entertained it she would show that she did not understand an element which is peculiar to the Mediterranean—war. Its basin is a very touchy field for trying experiments. For war men, iron, gold, and bread are necessary. The first two are most important as they easily find money and bread, but the latter seldom procure men and steel, and so I arrive at the boundary stone which throws a deep dark shadow on proud England. If she does not soon make a change in her whole military organization, if she does not recognize in a very short time the danger she runs through lying dormant and impotent amid a world armed to the teeth, it will fare hard with John Bull's bills of exchange. History and the insular position of his country make it difficult for the Englishman to recognize what is absolutely necessary in order that he should have a voice in the council of the nations, and cause him to lose sight of the grand principle on which modern States are founded, that of universal service.

England possesses no proper army, but only an enlisted force which keeps its debtor and creditor account and whose administration (!) is thoroughly commercial.

That which the German has long considered his most sacred inalienable right, to take his place among the defenders of his country, is looked upon in England as almost a disgrace. Hence there is no military science or real military education. The only recompense is money; for with a mercenary army money means soldiers, soldiers form an army, and armies mean peace, another word which the Englishman reveres next to gold.

And yet if we judge of the English line of communication through the Mediterranean from a military and naval point of view, we cannot but recognize that the British people are not only a nation of shopkeepers, but

also an energetic nation, a people who can not only play at chess but understand how to handle cold steel.

But although England may at any time be engaged in all quarters of the globe, and fortune is not always so kind as in Egypt (witness the Majuba Hill), we find an indifference in England to things military which to us is simply inconceivable. We hear everywhere that the soldier is unproductive capital and that it costs the State useless sacrifices to maintain him. They do not understand that a nobly born people should feel it as a disgrace to be willing to hand over to hirelings the noble duty of defending the highest interests, throne and fatherland. Distinguished English Generals, such as Lord Wolseley and Sir F. Roberts, have recognized the danger of England's torpor. Although England owes so much to these two Generals, their representations for the improvement of army organization have as yet had no real result; nor could they expect it, as they trenched on the vital point—universal service. So too have the proposals for army reform failed, which raised such hopes in England in 1881, and the British troops in India have not been kept up to full strength. The standing army has fallen off, and people console themselves with the Army Reserve and Volunteers, on whose insufficient organization I will not enlarge. There is nothing attractive in these mongrel soldiers who play with arms without being able to handle them, who wish to fight and are afraid of seeing blood, who desire to be soldiers and detest obedience. Soldiering is too serious and difficult a matter to be learnt by playing at it. The home regiments instead of being real units are merely depôts for the troops in the colonies, and thus one part of the army is broken up to keep the other up to strength, a costly principle and contrary to all military rules. The present system must be abolished, for it is not enough to be merely passively organized in face of the great States of Europe. The nation that assumes a position in the world must be able to stand collision with the world.

As England does not understand the real nature of war and has not learnt from history that the fate of a nation may be sealed in a few hours, as she does not know that the conditions must be prepared in peace time in order to enter the battle field with confidence as to the result, and that it is a fundamental axiom in strategy that war material is capital which must be spent freely in order to make profits, perhaps the old Napoleonic saying will be realized in her case, "*trop tard d'une année, d'une idée, et d'une armée.*" The fate of Carthage should be a warning to her.

The weakness of England's organization may be fatal to her if her military forces are out of all numerical portion to her size and power; and if she ignores any longer the "quantitative" factor in the art of war. If one is content with a certain minimum of fighting power, every military undertaking becomes impracticable, for not only must the decisive stroke be dealt with this minimum, but one ought still to be strong enough to push one's advantages and preserve what has been gained. The heroic handful of troops in Spain, that tough rabble of heroes under the Iron Duke, belongs to a by-gone age.

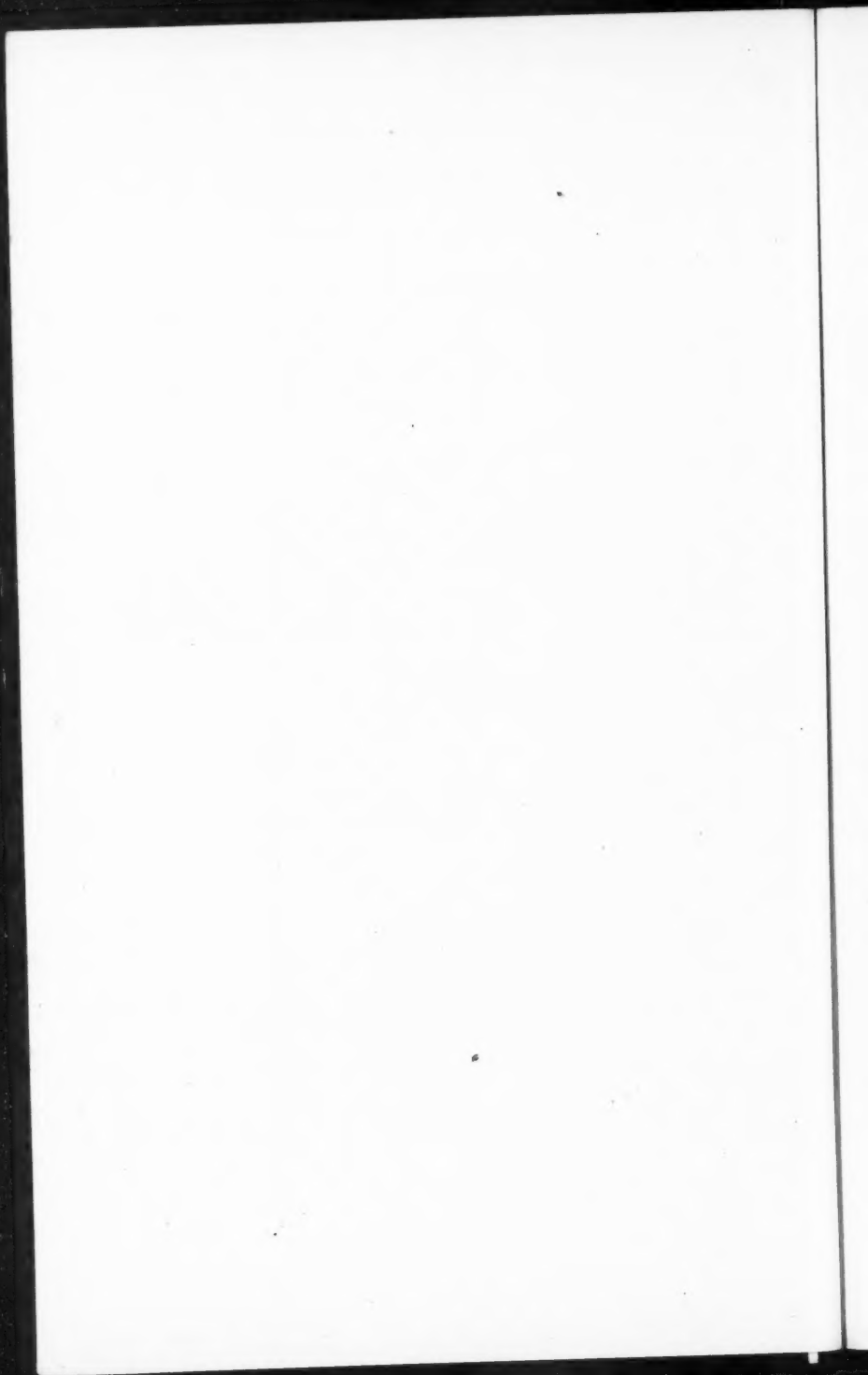
There is no present prospect of the British nation troubling itself with the reforms proposed by its army leaders, much less of its adopting the ideas so firmly ingrained in Germany. Universal service, with its unquestioning fidelity and love of country which make self-sacrifice a matter of course, is incomprehensible; German military education is regarded as a system of external, bodily training; and it is not recognized that the army is an immense national school where the subject is morally and physically fortified for the benefit of throne and state and educated to be a good citizen; that this it is which gives a stoical calm to united armed Germany and enables her to look every danger in the face without wincing.

Lastly, if England flatters herself that she strategically commands the

theatre of war—the sea—how does she expect to oppose tactically a European adversary on the battle field? What forces has she at command if she has to fight where the fleet cannot get?

It is perfectly clear that the time is rapidly approaching when England will have to oppose Russia in the east. It is now felt in England that a fatal mistake was made in following, in spite of the best military advisers in India, the incomprehensible principle that Russia should be allowed to approach nearer and nearer in Central Asia, as she would only weaken herself the further she left her base of operations, and also in that high flight of statesmanship—the evacuation of Afghanistan. They allow Russia to seize important strategic positions, which covered India, in order to be able to strike her! Afghanistan is the strategic bulwark of India, the Indus is only the ditch of the fortress; they only can be indisputable rulers in India who rule both in Kabul and Herat, the pearl of the world.

We Germans, as a rule, take too little interest in political matters. Who among us speaks of the Asiatic continent, of Lebanon, or of Cæsarea, where in 1883 the territory presented by the Sultan to our Emperor was taken possession of? But as we too have Mediterranean interests and events there deeply affect the foundations of Germany and Austria, as we live in times when gigantic prizes are drawn in the world lottery, and nothing can be gained but what we snatch suddenly and powerfully out of the whirlpool, it is necessary for both our Empires to be vigilant and armed; especially as the fifty years have not yet elapsed within which, according to Moltke, the German Empire will have to fight in order to justify her existence; and assuredly the Mediterranean question will not be settled definitely without a grand struggle.





## SUPPLY OF AMMUNITION TO ARMIES IN THE FIELD.

[This subject was dealt with by Major Waller, R.E., in No. CXVI of the Journal, with special reference to the supply of ammunition to infantry on the field of battle. Regulations on the whole question of supply of ammunition to an army in the field have been drawn up this year for the French army by General Campenon, the Minister of War, and the substance of them is given in the following pages.—L. A. H.]

The ammunition supply of an army includes :—

- I. Ammunition for the line of battle.
- II. Ammunition in the parks of the corps d'armée.
- III. Ammunition in the park of the army or grand park.

### *I. Ammunition for the Line of Battle.*

This comprises : 1st. The cartridges carried by the men themselves, and those carried in the battalion wagons, 96 (78 + 18) for each man. The batteries carry with them about 150 rounds per gun. 2nd. The ammunition section accompanying the troops, and raising these amounts to a total of about 142 cartridges per man and 200 rounds per gun.

In a corps d'armée, to each infantry division is attached one section of infantry and one section of artillery ammunition. To the corps artillery two ammunition sections are attached.

When the army corps is massed, these sections march together ; but when any portion of the corps is detached, it is accompanied by its section. A chef d'escadron of artillery on the staff of the General commanding that arm of the corps d'armée is responsible for the supply of the line of battle, and commands the column of sections when on the march.

### *II. Ammunition in the Parks of the Corps d'Armée.*

Each corps d'armée is followed by an artillery park commanded by a Lieutenant-Colonel, styled "Director of the Park of the Corps d'Armée." Officers and employés are attached to his staff.

This park carries about 33 cartridges per man and 72 rounds per gun. It includes four park sections under the command of a chef d'escadron of artillery, a detachment of workmen and one of artificers. Three of these sections carry both infantry and artillery ammunition ; the fourth carries artillery ammunition only and spare stores for the artillery. These sections are not told off to any particular portion of the corps, but are for the general supply of the corps and even of troops not belonging to it. In urgent cases the ammunition sections supply other troops than those to which they are specially attached.

This park undertakes also replacing the vehicles of the corps and any repairs of importance. For this purpose the fourth section is furnished with spare stores, raw material and tools. It carries also case shot and all supplies besides ammunition which are furnished by the artillery.

### *III. Ammunition in the Park of the Army or Grand Park.*

This park is under the command of a Colonel or Lieutenant-Colonel of artillery styled "Director of the Park of Artillery of the Army." His staff

consists of a Field Officer as sub-director, and of a number of Captains and employées in proportion to the importance of the park.

The ammunition is carried in wooden boxes, and is divided in five equal échelons. A portion of the boxes may be carried on the park wagons, the transport of the park. The second échelon is loaded on railway forming trains, and stationed in advance of the station magazine. The three others are either brought up to this magazine or are kept in rear.

This park suffices for making good the corps parks, and the ammunition sections.

### *Replacing Ammunition in the Line of Battle.*

#### *1. Infantry Ammunition.*

In a regiment the *personnel* specially told off to the battalion wagons includes a chief artificer, mounted, and charged with general superintendence of all the regimental wagons; a non-commissioned officer in charge of each battalion wagon and two soldiers to each wagon; the non-commissioned officer and the soldiers mount on the wagons only when these are moving rapidly. The supply of the troops is from the wagons after all cartridges taken away from men for any reason have been used up. The battalion wagons are refilled as soon as possible by the artillery on the order of the Commandant. The cartridges of men placed *hors-de-combat* are carefully collected for distribution among the combatants; any in excess after completing the individual supply is placed in the baggage wagons, or in wallets carefully tied up; cartridges are returned to the artillery, only when there is no means of carrying them with the corps. On the field of battle the battalion wagons are kept together regimentally; only exceptionally do they accompany the battalions. Their position is assigned to them by the Officer commanding the regiment or battalion, and they as far as possible keep concealed from the view of the enemy. They should be not more than 1,000 metres from the firing line, but less when cover is available; in all cases they must follow the troops as near as possible to the shooting line. At critical moments the Commanding Officer may direct them to be moved rapidly up to the shooting line. Their position is marked by day by a yellow banderol placed as far as possible well on the flank, so that it may not afford a mark for the enemy, and at night by a yellow light. On the field of battle, horses required to replace those in the battalion wagons are drawn from the ammunition sections on the order of the General of the division, or in cases of urgency of the brigadier.

One or more extra packets of cartridges are issued to the men before joining the shooting line, and every favourable moment is seized for renewing the supply. In important defensive positions, depôts of ammunition may be established along the line, and even the battalion wagons may be posted there, provided cover can be obtained for them. Obtaining ammunition by sending men for it from the front or any similar means is absolutely forbidden; it is to be brought from the wagons to the shooting line by men of the reserve companies told off for the purpose. Each of these men carries a double wallet, twelve of which are in each wagon.

In the double wallet are placed 60 packets of cartridges. The weight of a wallet thus loaded is about 37 lbs., and it is carried slung over the shoulder, one pocket in front, the other behind. If time presses, the bundles of thirty packets in which these packets are made up, need not be opened before placing the packets in the wallets, but the breaking up is preferable. The bearers of the wallets distribute the cartridges among the shooters, returning to the wagons for a fresh supply when the contents of the wallets are exhausted. If a battalion wagon has to supply troops other than those to which it is attached, the non-commissioned officer in charge of the wagon makes the issue on a voucher, or in default of one on a simple memorandum.

perhaps written in pencil, but signed by the Commanding Officer of the battalion, and bearing the number of the company, battalion, and regiment to which the ammunition is issued, the amount of the demand, and the rank and signature of the individual making the requisition. As a rule, when the battalion wagons are together, one is emptied before ammunition is issued from another; the chief artificer being responsible for the replenishment of his supply must consequently know where the ammunition section is posted, and take care that the non-commissioned officers in charge of the wagons are also acquainted with its whereabouts. As soon as a wagon is nearly emptied the remainder of its contents is placed in the wallets, and the chief artificer sends to the ammunition section for a full wagon. This is brought up by a corporal, and its contents transferred to the empty battalion wagon, the non-commissioned officer in charge of the latter giving a receipt specifying the nature of the ammunition delivered to him, and the hour at which he received it. The empty wagon then returns to the ammunition section.

### 2. Artillery Ammunition.

On the field of battle the battery of artillery is divided into two groups; the fighting part (*la batterie de combat*), 6 guns and 6 wagons, and the reserve, 3 wagons, *le chariot de batterie*, and the forge wagon. When the *batterie de combat* approaches the position where it is to come into action, three of the wagons are left in rear under the charge of the quartermaster-sergeant at a distance not exceeding 300 mètres, according to the amount of shelter available. These three wagons form the first échelon for keeping up the supply of ammunition. The reserve of the battery is placed as the second échelon at from 5 to 800 mètres in rear of the first échelon as much as possible under cover and in easy communication with the battery. When the contents of the second box of the wagon of each section of the battery are nearly exhausted, the Captain orders up the three wagons of the reserve which come up in rear of the sections to which they belong, and take post on a level with the nearly emptied wagons. When these are quite emptied they are driven to the reserve, the three wagons of which move forward to form the first échelon. In urgent cases the wagons of the reserve may be brought sooner up to the first échelon. With the empty wagons are taken away the wounded men; the wagons may be drawn by reduced teams. When the empty wagons arrive at the reserve a demand is at once sent to the nearest ammunition section for three full wagons, the requisition stating the number of the battery and the nature of its guns. When the section wagons arrive at the reserve their contents are transferred to the wagons there, and then the section wagons return to their section. It is advantageous sometimes to collect the reserves of a group of batteries together near a road some 500 to 1,000 yards in rear of the batteries. By order of the senior Officer of a group of batteries, any one battery may, if occasion requires, be supplied from the reserve of another battery.

### 3. Ammunition Sections.

The sections must keep near the troops to which they belong, so as to meet their demands for ammunition without delay. In the normal order of march of a corps d'armée their place is with the fighting train, immediately after the engineer park. When the corps moves on two roads the section is divided between the two columns. On the field of battle, if no particular position has been assigned to them by the Generals of artillery or divisions, they take up a position some 1,500 mètres in rear of the line of fire near the groups of batteries to which they are attached, and as close to practicable roads as possible. Only in case of necessity do they remain on the road; and then in single file on the right side, quitting it as soon as means for

getting off it have been provided. If an action commences unexpectedly, the commander of a section moves up at once of his own initiative to a suitable position, notifying his arrival there to the Generals commanding the artillery and the divisions. Yellow flags and lanterns are used to indicate its position. After an action the sections proceed to a rendezvous named by the General commanding the corps, to obtain fresh supplies. Here they are collected in one column under command of an Officer. The system of making good supplies is by the transfer of ammunition from one vehicle to another, and only in very rare cases should there be an exchange of the vehicles themselves. Cavalry divisions are permitted to make good supplies of ammunition from the parks of any corps d'armée, no matter to which corps they may be attached.

*Supply from the Park of the Corps d'Armée.*

This park is usually a day's march in rear of the troops. During an action and to facilitate supply, its sections may be brought nearer the ammunition sections. The park sections march together, and form a single centre of distribution. When a sufficient number of the wagons are exhausted of their contents they are sent in one column to the nearest échelon of the army park to be refilled.

*Requisitions, Receipts, &c.*

All demands, however informally drawn up are complied with so long as they bear the signature of some Commanding Officer, but those made during an action by Officers commanding battalions must be subsequently countersigned by the Officer commanding the regiment. Verbal requisitions may, however, be complied with. Returns of ammunition are rendered after an action, and also every five days.

*Supply from the Park of the Army or Grand Park.*

The first échelon is kept so far in rear of the army that it may be at one day's long march, or at most two days' march, from the sections of the corps parks; the second échelon two days' march at most from the first. The other three are at the station magazine, or at places designated by the Commander-in-Chief. The movements and working of this park are regulated by the General commanding the artillery of the army, assisted by the director of the park.

*Supply from Fortresses, Manufactories, &c.*

The governors of fortresses, isolated and situated in the zone of operations of an army or army corps acting alone, are under the orders of the army or corps commander, and must comply with his demands for ammunition, but otherwise the governor of a fortress may not, without special authority from the Minister of War, comply with demands unless they can be met from the surplus ammunition of the fortress. The normal supply for the fortress itself must not be trenchoned upon. The manufacturers furnish supplies on the order of the Minister, and make them in certain cases direct to the field army, but extreme care is to be taken when doing so to avoid disorder and confusion.



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## EXTRACT FROM THE BYE-LAWS.

### Section II.—Composition.

1. Princes of the Blood Royal; Lords Lieutenant of Counties; Governors of Colonies and Dependencies; Officers of the Army, Navy, Marines, Her Majesty's East Indian Military and Naval Forces, Militia, Yeomanry, Royal Naval Reserve, and Volunteer Corps shall be entitled to become Members, *without ballot*, on payment of the Entrance Fee and Annual Subscription.

N.B. Any Officer coming within the above definition, who may wish to become a Member of the Institution, can do so by copying one of the subjoined Forms, and inclosing it to the Secretary:—

#### FORM FOR BECOMING AN ANNUAL SUBSCRIBER.

18

It is my desire to become a Member of the Royal United Service Institution; and I hereby request and authorise my Agents [or Bankers], Messrs. \_\_\_\_\_, to pay my Entrance Fee (£1) and Annual Subscription (£1) now, and as it becomes due on the 1st of January in each year, to the Secretary of the Institution.

\_\_\_\_\_  
Signature.

\_\_\_\_\_  
Qualification  
for Membership.

#### FORM FOR BECOMING A LIFE SUBSCRIBER.

It is my desire to become a Life Member of the Royal United Service Institution; and I hereby authorise my Agents [or Bankers], Messrs. \_\_\_\_\_, to pay my Entrance Fee (£1) and Life Subscription (£9) to the Secretary of the Institution.

\_\_\_\_\_  
Signature.

\_\_\_\_\_  
Qualification  
for Membership.

2. Ex-Governors of Colonies and Dependencies, Retired Officers, Deputy Lieutenants of Counties, Civil Functionaries who are or have been attached to the Naval and Military Departments, the Master, Deputy Master, and Elder Brethren of the Trinity House, and Army and Navy Agents, shall be *eligible* to become Members by *Ballot*.

3. Gentlemen above the age of *fifteen*, whose names are on the list of the Commander-in-Chief for Commissions in the Army, or who are probationary for offices connected with the Naval and Military Professions, shall be *admissible*, by *Ballot*, to become **PROVISIONAL MEMBERS** from year to year, on payment of the Annual Subscription; and after they obtain their appointments, they may become ordinary Members on payment of the Entrance Fee.

N.B. Members admissible by Ballot must be proposed and seconded by two Members of the Institution, and their names will be submitted to the Council for election. Ballot papers may be obtained at the Institution.

### Form of Bequest.

*I give and bequeath unto THE ROYAL UNITED SERVICE INSTITUTION, situated in Whitehall Yard, London, the sum of \_\_\_\_\_ to be applied in and towards carrying on the designs of the said Institution, such Legacy to be paid out of such part of and personal Estate not specifically bequeathed as the law permits to be appropriated by Will to Charitable Purposes.*



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THE COUNCIL of the ROYAL UNITED SERVICE INSTITUTION are very desirous of obtaining the assistance of OFFICERS of the NAVAL and MILITARY SERVICES in carrying out the different Courses of Lectures at the Institution.

The Lectures, and the Discussions which follow them (or an Abstract of them), and Descriptions of Inventions, are published in the Journal of the Institution, subject to the discretion of the Council, and illustrated, when necessary, by Diagrams.

N.B.—Officers who will favour the Institution with a Lecture, or a Course of Lectures, are requested to communicate with the Secretary on the subject as early as possible.

By order of the Council,

B. BURGESS, Captain,

*Secretary.*

